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A review of ten years of CO₂-based Company Car Taxation: impact and potential

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Abstract

Company cars represent the majority of UK new car sales and thus have a dominant effect on the fuel use characteristics of the entire car stock. In April 2002 a major reform of the company car taxation system was introduced with the car's CO₂ emissions being a key part of determining the cash equivalent of the benefit on which tax is due.

HMRC studies have indicated that this tax reform has produced a substantial and ongoing improvement in company car fuel efficiency. This was largely through the tax system favouring diesel cars and led to the substantial rise in diesel cars sold in the UK. However, as the transport policy agenda has moved towards the promotion of hybrid and low carbon vehicles, it is notable that these have had little uptake in the company car sector, despite adjustments in the tax structure providing them with substantial incentives.

This paper presents an analysis of the way in which this tax structure makes it difficult for low carbon cars to compete against diesel vehicles. Battery electric cars also suffer the disadvantage of not being well suited to the high mileages characteristic of company cars.

However the tax structure looks set to particularly favour new generation hybrids and plug-in hybrids. Indeed, the company car tax structure could well tip the balance to making plug-in hybrids the dominant clean vehicle technology. However, the 2012 change to the tax bands failed to take into account the effect on the uptake of low carbon vehicles and could undermine an already fragile uptake of new low carbon technology vehicles.

Introduction: The Company Car Factor

Company cars have formed a major part of new car registrations since the 1970s. Company cars thus have a major influence upon the UK car stock, including the overall fuel efficiency and CO₂ emissions from the car fleet. If low/ultra-low carbon vehicles are to be in widespread use, then it is crucial that uptake is substantial in the company car market.

Company cars emerged as a form of ‘income-in-kind’ for middle and senior managers during the early 1970s, when rises in cash income were subject to anti-inflation incomes policy restrictions. Providing cars instead of cash got around these government restrictions. However, companies then realised that the valuation of cars and fuel was so low that this also represented a very effective means of tax avoidance. Thus, even after the anti-inflation incomes policies ended, companies continued to provide company cars, which quickly became part of the pay culture. By 1975 37% of new UK car registrations were in a company name, rising to 40 – 45% in the early 1980s and has continued to grow to 50-60% today (Table 1).

Table 1: UK Cars registered for the first time, selected years 2001-2010 (Thousands)

Year	Privately registered		Company registered		Total registered
	Number	%	Number	%	Number
2001	1 369	53	1 216	47	2 585
2005	1 056	43	1 388	57	2 443
2008	858	41	1 254	59	2 112
2009	980	50	989	50	1 969
2010	905	45	1 091	55	1 996

Source: UK Department for Transport (2011a)

In the 1980s the main transport policy concern was that the company car taxation regime undervalued the private benefit of company cars and that it also resulted in the purchase of cars with higher fuel consumption than if the individuals had purchased their own car. The 1984 *Company Car Factor* report (Baker et al, 1984) estimated that the undervaluing of company car benefits amounted to an effective state subsidy of £1.8 billion and noted that the average engine size of new company registered cars was 1 610cc compared to 1 340cc for privately registered new cars. The tax treatment of company cars was thus a large state subsidy supporting car use for a high income minority, and which resulted in poorer fuel economy in the car stock as a whole.

This concern is also reflected at the EU level, where levels of company car purchases are similar or greater than in the UK. In 2010, the tax loss attributable to company cars across the EU was estimated at €54 billion per annum (CEC 2010).

The UK Treasury came to recognise this issue, and through the late 1980s and into the 1990s, tax rates were increased on company cars and fuel for private use. By 2000, the tax loophole was substantially closed, but company cars remained engrained in the pay package culture for UK middle and senior managers. However, although income as cars and fuel was now taxed on broadly the same basis as income in cash, the system was only designed to provide tax equity in an administratively efficient manner. Wider transport policy issues had no influence upon the design of the company car tax system, and indeed it had a number of features that produced adverse transport and environmental impacts.

The method to tax the value of company cars available for private use¹ was for a cash equivalent value to be added to an individual’s income for tax purposes. As noted above, the main issue had been that this was a realistic figure. By 2001 the cash equivalent for tax purposes was assessed as 35% of the car’s new list price. There were, however, reductions to tax liability related to the amount of business travel undertaken by the driver. The tax

¹ It should be noted that, unlike in most mainland European countries, in the UK commuting to and from work is viewed as private travel. Commuting is not a tax-deductible expense and so the commuting benefit of a company car is viewed as private income-in-kind.

charge was reduced to 25% if users drove more than 2 500 miles on business and was cut further to 15% if they drove 18 000 miles on business. There were also tax discounts for drivers of older company cars.

These thresholds for tax reduction were widely criticised as generating unnecessary car travel and CO₂ emissions to cut the individual's tax liability. In the context of growing concerns about the environmental impacts of transport activities, the company car tax system was criticised as supporting the purchase of high CO₂ emitting vehicles that were then driven further to cut tax liability. The company car tax system was out of line with the principles of context-based sustainability (McElroy and van Engelen 2012). This is that sustainability measurement, management and reporting needs to be context-based in order to be meaningful. There is little wonder the company car tax regime attracted much criticism because it did not particularly have the desired positive impact on environmental sustainability and transport policy as a whole.

The 2002 Company Car Taxation Reform

By 2000, the context was that the UK government had begun the implementation a number of policies to reduce the environmental impacts of transport. These included a range of measures on vehicle fuel efficiency working towards to the current EU regulations requiring average new car emissions to fall to 130g/km by 2015 and included changes to the tax regime. For example, in 2001 Vehicle Excise Duty had been reformed to be graded by the car's test CO₂ emissions, with a further reduction for cleaner fuelled cars (for details see Potter and Parkhurst 2005). In April 2002 a major reform of the company car taxation system was introduced using a similar approach, with the car's CO₂ emissions being a key part of determining the cash equivalent of the benefit on which tax is levied. These policy actions can be viewed in the light of the analysis by Gray (2011), who identifies two main views of sustainability policies:

- the marginalist or weak sustainability view
- the radical, structural or strong sustainability view

The former holds that current improvements in such things as taxation, technological efficiencies and improved market mechanisms coupled with voluntary initiatives will steadily swing the capitalist ship around to achieve a more sustainable future. This links in with the 'nudge' philosophy that has attracted much policy attention in the UK (Sunstein and Thaler 2008). Additionally such an approach towards sustainability is likely to be within a context-free framework where actual social and/or environmental conditions in the world are not explicitly taken into account as indicated by McElroy and van Engelen (2012).

The radical/structuralist view, however, is one that is sceptical of the improvement achievable by the marginalist/nudge approach. It takes the view that, despite any improvements in efficiencies, the trend away from sustainability remains, merely having been slowed. Such a view would advocate a move towards a less highly motorised society and, rather than seeking to 'green' the company car sector, might suggest that company provided cars have no place in a sustainable transport system. This view is largely in the domain of context-based sustainability management where carrying capacities of capitals, responsible populations are taken into consideration according to McElroy and van Engelen (2012).

With the change to company car taxation representing a marginalist approach, it is pertinent to ask what level of change this reform has effected in the sustainability of car use, and what potential it might contribute in the future. This has implications not only for UK company car taxation policy, but for that in the EU as a whole, as the UK reform is viewed somewhat as an exemplar for other EU states to emulate (CEC Tax, 2010).

The method adopted in the 2002 company car taxation reform was to weight the new list price of the car by a percentage factor that varies according to the car's test CO₂ emissions. Discounts for high business mileage were abolished, together with most age-related

discounts, which had provided an incentive to drive further and to use older, more polluting cars².

So, for example, a car with a new list price of £25,000 and test CO₂ emissions of 152g/km would fall in the 20% band, and so the annual tax benefit would be assessed as:

$$£25,000 \times 20\% = £5,000 \text{ per annum}$$

For income tax purposes, this sum would be added to the individual's income and tax paid at the appropriate marginal rate. So if the individual's cash income took them into the 40% tax bracket, they would pay 40% income tax on the above sum (i.e. £2,000). The following table shows the 2011-12 percentage bands.

Table 2: Company Car price percentage values 2011-12

CO ₂ emissions (g/km)	Percentage
0	0%
1 – 75	5%
76 – 120	10%
121 – 129	15%
130 – 139	17%
140 – 144	18%
145 – 149	19%
150 – 154	20%
With rise of 1% for every rise of 5g per km until:	
220 – 224	34%
225 and above	35%

Source: HMRC (2011)

This system has been gradually refined since its introduction in 2002. Initially, the charge ran from a base level of 15 percent of a car's new list price, for cars emitting 165 grams CO₂ per kilometre (g/km), in 1 percent steps for every additional 5g/km over 165g/km to a maximum charge of 35% of a car's price. These bands have been adjusted since the system was introduced, particularly to stimulate the use of lower CO₂ emitting cars. So, whereas in 2002 the 15% rate was charged on cars emitting 165g/km, in 2012-13 the 15% band is for cars emitting 120-124g/km and by 2014-15 will be for cars emitting 110-114g/km. It is important to regularly revise the CO₂ tax bands to reflect and to stimulate improvements in car fuel efficiency.

In 2010, 10%, 5% and 0% bands were introduced. Initially cars solely powered by electricity were charged at 9% of their list price, but from 2010 electric cars were rated at 0% and ultra-low emission cars (75g CO₂ or less) at 5%. The 10% band is for low-emission cars in the 76 – 120g range. In general, the revisions from 2010 have resulted in the cleaner fuel technologies being incorporated into a single simplified table based entirely on test CO₂ emissions.

The lower charge bands are only a temporary measure and in the 2012 Budget it was announced they will be phased out by 2016/17 when all cars will again pay a minimum of 15 percent, but that rate will be for vehicles emitting 95g CO₂ or less. The percentage rates for higher emitting cars will also have increased and there will be 36 and 37 percent bands introduced for cars emitting 195-199 and 200 or more grams of CO₂. Thus a finer graduated system will return.

As well as the provision of a car, some employers provide free fuel for their employees. The benefit of free fuel supplied for the private use of a company car user is also weighted by the

² Notably, 'classic cars' are excluded from these (and also certain other tax) provisions, and a minority effect has been to encourage the ownership of such cars as company vehicles. They are by definition old, and generally produce high levels of emissions.

same percentage for CO₂ emissions as used to calculate the company car taxable benefit. To report the actual amount of free fuel supplied to each individual company car user would be administratively burdensome, and so a generic system of assessment is used instead. This is based on a scale charge (currently set at £20,200 but only £550 for vans); if the company car's CO₂ emissions places it in the 20% band, the cash benefit of free fuel would be calculated as:

$$£16\,900 \times 20\% = £3,380$$

If the employee tax rate were 40% then they would pay £1,352 annual tax on free fuel.

If the employee felt they were not likely to spend £1,352 on fuel for private use of their company car (and private use includes commuting to and from work), then they can opt out of receiving free fuel, and many company car users have done so. The overall proportion of company car drivers provided fuel for private use decreased from 57% in 1997 to around 30% in 2005 (HMRC 2006).

Free electricity provided by an employer for the private use of electric company cars is not taxed.

Impacts of the Tax Change

The new company car taxation system means that car users can cut their tax liability by a large amount if they shift down the CO₂ percentage bands. For example, a 40% tax payer with a £25,000 car, if they shifted from the 25% to 15% band, would save £1,000 per annum.

Initially, the most cost effective and easiest way to do this has been to shift to the best CO₂ performance in class of car or, in particular, to diesel cars. In 2002 only 30% of company cars were diesel, but this figure rose to 50% in 2004 and is now over 60%. This has resulted in a major growth in the purchase of diesel cars in the UK as a whole (Table 3).

Table 3: All UK Car sales by fuel type, 2000-2009

	<i>Petrol</i>	<i>Diesel</i>
2000	87%	13%
2002	85%	15%
2005	79%	20%
2009	73%	27%

Source: UK Department for Transport (2011b)

HM Revenue and Customs (previously the Inland Revenue) has conducted two detailed assessment studies of the impact of the company car tax change (Inland Revenue, 2004 and HMRC, 2006). The first study was an initial assessment that showed average CO₂ emissions of new company cars decreasing from 196 g/km in 1999 to 182 g/km in 2002 (the first year of the new system). More recent data from the UK National Travel Survey (shown in Table 4) shows that as well as the cars emitting less CO₂ per kilometre, business distance travelled by company cars is now 45% lower than under old system. This relates directly to the withdrawal of the tax reduction breaks for high business mileage.

Table 4: Annual Kilometres of Company Cars 1997 and 2009

	<i>Business</i>	<i>Commuting</i>	<i>Other Private</i>	<i>Total</i>
1997	19,140	9,530	8,920	23,590
2009	10,610	9,480	9,510	29,600

Source: UK National Travel Survey Table 0901

The number of business kilometres has reduced by (over 300 million miles) per year and the overall effect of the change in vehicle type and reduced distance travelled has been to cut the emissions of carbon from the company car fleet by 25,000-35,000 tonnes per annum. This one impact represents around 0.5 per cent of all CO₂ emissions from road transport in UK.

The effect upon business travel is a one-off, but the impact on the CO₂ emissions on the type of company cars purchased has been ongoing, so the carbon reductions have improved over time. The Stage 2 evaluation report (HMRC 2006), calculated that average CO₂ emissions figures from company cars were around 15g/km lower in 2004 than would have been the case if the reforms had not taken place. This estimate refers to the impact of the company car tax reform over and above the general reduction in CO₂ emissions from cars in recent years. Overall they estimate that the carbon reduction were around 0.2 - 0.3 MtC for 2005 and may increase to around 0.35 - 0.65 MtC for 2010 and reach a maximum level of savings in the long run of around 0.4 - 0.9 MtC per year towards the end of the next decade.

Rather than being a factor that worsens CO₂ emissions, the research in the 2006 evaluation report stated that if the drivers no longer had company cars, on average, they would choose private cars with CO₂ emissions figures around 5g/km higher.

Overall, the resultant changes suggest that this 'nudge' style reform has had a real and useful impact. This measure has produced substantial reductions in CO₂ from the effect of company cars on the national car fleet and on company cars in operation. Furthermore, this shift to a CO₂ emission-based evaluation was politically and socially acceptable. Unlike some other transport taxation measures, it has not attracted fierce opposition from users. It has generally been welcomed as an appropriate reform for environmentally conscious times.

However, this effect has been what Gray classifies as a marginalist or weak sustainability in that the CO₂ emission reduction is not transformative. This non-transformative nature of these reforms can largely be attributed to the fact that they are done in what by McElroy and van Engelen (2012) call a context-free manner. To achieve an 80 percent cut in CO₂ emissions from cars (as is implicit in the government's ambitious 2050 decarbonising target) requires the widespread adoption of ultra-low carbon technologies, coupled with new practices and travel behaviours (Potter, 2007). This reform has not set us upon such a transformative context-based path.

Impact on Cleaner Vehicle Technologies

The need for a more transformative approach than that achieved by the company car tax reforms is evident when longer-term objectives are considered. Research and policy documents on the diffusion of low carbon technologies tend to adopt a motor industry, supply-oriented perspective in which there is a transition away from existing petrol and diesel engine cars. An example is the 2009 NAIGT roadmap, which envisages the eventual transition to hydrogen fuel-cell vehicles and advanced battery electric vehicles, via intermediate technologies such as present hybrids, battery cars and plug-in hybrids (New Automotive Innovation and Growth Team (NAIGT), 2009).

Some studies have sought a more demand-side understandings, but, given their large share of the new car market in the UK and in most other European Economies, it is surprising that the Company Car sector has received relatively little attention.

A 2010 Royal Academy of Engineering study noted the needs of the company car sector in general terms, noting that 'To make a significant difference to emissions, electric vehicles will have to appeal to the mainstream family car and company car sectors, which means they will have to compete economically with petrol and diesel models.' (Royal Academy of Engineering, 2010, p.17)

One low carbon vehicle study that has considered the characteristics of the company car sector is Hazeldine et al (2009) in the report on the market outlook to 2022 for battery electric vehicles and plug-in hybrid electric vehicles. This mentions (p 55) that this sector seeks to minimise their exposure to risk, 'hence, business/fleet buyers are also likely to need some form of upfront price support to encourage them to purchase EVs and PHEVs'³. The company car taxation system is noted in passing (p. 56), but its influence is not considered in any detail.

³ EV= Electric Vehicle; PHEV= Plug-in Electric Vehicle

As noted above, despite the high tax concessions for cleaner fuel vehicles, uptake of these technologies has been very low in the UK company car market. Even the uptake of petrol-electric hybrid company cars (available since 1999) has been small. A closer examination of how the tax charge is calculated helps to explain this. The initial generation of hybrid cars offered little tax reduction compared to diesels, particularly given their higher purchase price. Because purchase price is part of the tax formula, then the high price of a hybrid would counteract moving into a lower CO₂ percentage band.

For example, if a company car user had the choice between a petrol car costing £20,000 and emitting 170g/k of CO₂, a diesel car costing £22,000 (145g/k), and a petrol-electric hybrid costing £26,000 (135g/k), then the taxable value would be:

Petrol Car: £20,000 x 24% = £4,800 per annum
 Diesel Car: £22,000 x 19% = £4,180 per annum
 Hybrid Car: £26,000 x 17% = £4,420 per annum

So, even though the hybrid car is in a lower percentage band, its higher price means that the user would pay more tax compared to a diesel car. In situations where hybrid cars only deliver a relatively small CO₂ improvement over diesel cars, it does not make financial tax sense for company car users to opt for a hybrid. However the situation has recently changed. Firstly, there was the creation of the new 10% band for company cars emitting 76-120g/km of CO₂. Secondly, there are now more competitively priced petrol-electric hybrids suited to the company car market that are opening up a CO₂ gap with diesels. For example the recently launched Lexus CT has test CO₂ emissions of 94g/km, placing it in the 10% band, with comparable diesel models in the 17-18% bands. Current models of the Prius, with CO₂ emissions in the 89 g/km to 92 g/km range, also place them in the 10% band.

The price of the Lexus CT hybrid is also relatively low (£23,750 in the UK), being only slightly higher than the price of a comparable diesel car. These combined effects mean that, for this class of car, the petrol/diesel/hybrid tax valuation situation has changed to something like:

Petrol Car: £20,000 x 24% = £4,800 per annum
 Diesel Car: £22,000 x 18% = £3,960 per annum
 Hybrid Car: £23,750 x 10% = £2,375 per annum

The introduction of the step-change lowest emissions bands, coupled with technical improvements to hybrids, has given the hybrid technology a major financial advantage. This is symbolised by the fact that Lexus have now produced a full range of hybrid cars particularly aimed at the company car sector, ranging in price from the CT at £23,750 to the £91,000 LS limo for eco-prestige conscious CEOs.

This example shows that, to support the uptake of more radical clean vehicle technologies, there is a need for a carefully designed step change in the company car taxation system. As originally introduced, the gradual incremental changes in the UK company car tax system only stimulated an incremental shift in car purchase patterns, simply leading to a switch to diesel cars. With the recent introduction of the step change for low emission cars, this seems to be leading to the wider adoption of more substantially cleaner vehicle technologies.

The 2012 Budget announced the phasing out by 2016/17 of the step change 0% and 15% bands and this raises the question as to whether this will eliminate the tax attractiveness of hybrids. The 2016/17 bands would lead to a tax situation of:

Petrol Car: £20,000 x 24% = £4,800 per annum
 Diesel Car: £22,000 x 18% = £3,960 per annum
 Hybrid Car: £23,750 x 15% = £3,563 per annum

This would put diesels and hybrids on roughly equal tax liability.

The phase out of the large tax advantage for hybrid and electric vehicles may be taking place too soon to really support the widespread take-up of low emission vehicles, particularly as there are other barriers to the uptake of new vehicle technologies that over-ride the tax financial advantage. As noted in the 2009 AEA report (Hazeldine, 2009), the company car market is able to set increased capital costs against lower running costs, so (within limits) a price premium should not affect the situation. However, uncertainties of residual value could lead to a delay in uptake, and the conservative nature of fleet managers and fleet leasing companies present additional institutional barriers. For hybrids, it appears that we are on the

verge of these institutional barriers being overcome, but for more innovative technologies, they could remain a factor delaying uptake.

If institutional issues are understood and appropriate financial packages are developed, it seems likely that the company car market could prove to be important for plug-in hybrids⁴ which have been introduced from mid 2012. Many of these will be in the (albeit it temporary) 5% company car tax band, although any initial high price may have a suppressing effect. The field is being led by the Vauxhall Ampera and Toyota's Plug-in Prius.

The Ampera, marketed as an 'Extended Range EV' to avoid confusion with existing hybrid cars, has a purchase price of £28,995 (including plug-in grant) so its tax valuation would be:

Vauxhall Ampera: £28,995 X 5% = £1,450

This means that a person on the 40% tax band would pay only £580 tax per annum. The Ampera is an expensive car in its class, but despite its price premium, the tax charge is close to only a third that of a diesel car, giving it a considerable taxation advantage in the company car market. So long as companies are willing to offer their staff plug-in hybrids, they could prove to be very attractive to users.

However, the phased introduction of the minimum 15% band will eliminate the tax advantage, and the price of an Ampera (or comparable plug-in hybrid) would have to drop by about 15 per cent to achieve tax parity with a diesel company car.

Pure electric cars (battery electric today and hydrogen in the future) are now in a 0% band, but there is little interest in these as company cars. The barrier is that battery electric cars are not really suitable as company cars, which are driven long distances. In the UK the average annual distance covered by company registered cars is 29,600km per car compared with 12,800km for privately registered cars⁵. These longer distances make recharging range an important issue for battery electric cars. The fitness of electric vehicles for the purposes of company vehicles to cover relatively longer distances has been noted as one of the major setbacks in using electric vehicles as company cars. For electric vehicles to be used as company cars as well as in fleets, a much more careful planning of journeys to match with the peculiarities of electric vehicles is required.

It is possible that the very attractive company car tax situation for battery electric cars may attract some niche uptake where other cost advantages may be present (e.g. exemption from the London Congestion Charge or where electric cars are given free parking) and where trip lengths are lower. Even there, the plug-in hybrid looks more likely to succeed.

Hydrogen cars will not be available for several years, with refuelling infrastructure being an important barrier to address. Added to this, by this time the temporary step change tax break will have long been gone.

Overall, plug-in hybrids look set to be attractive for the company car sector. They have nearly as much tax saving as a pure electric vehicle (as can be seen from the tax valuation of the Vauxhall Ampera above) with none of the range/function issues of its pure electric counterpart. A modest improvement in their price, quite likely as scale economies emerge, would maintain some tax advantage as the tax bands alter through to 2016. So it seems possible that, as they become available, the plug-in hybrid could take off in the company car market. The company car market is so large in the UK that this could tip the UK as a whole towards plug-in hybrids and marginalise electric vehicles to specialist fleet niches. Indeed it could set in place a dominant design that could make the market entry of hydrogen fuel cell vehicles very difficult.

There is already an issue that the widespread use of fuel cell vehicles could be difficult and expensive to achieve. Refuelling infrastructure does not exist presently and this will cost around £2 billion to put in place in the UK alone. Plug-in hybrids do not need any additional infrastructure. Furthermore, there are substantial energy losses and CO₂ emissions in distributing hydrogen to cars, which raises serious doubts as to whether hydrogen cars can ever be a sustainable transport solution. With a combination of decarbonised electricity and

⁴ Also called 'Extended range EVs'

⁵ National Travel Survey 2009

emerging second generation biofuels, plug-in hybrids could well represent a long-term low carbon solution.

Conclusions

Broadly, viewed as a marginalist 'nudge', context-free, policy approach, the reform of the UK company car taxation system has been successful in that this measure has produced substantial reductions in CO₂ from the effect of company cars on the national car fleet and on company cars in operation. It is seen as an international exemplar for other states in the EU.

An important point is that the 2002 reform was not a single change. The company car taxation framework has been developed and refined, with regular revisions to the CO₂ tax bands to reflect and stimulate improvements in car fuel efficiency, and also the introduction of 'step change' bands to encourage the uptake of radically clean car technologies. These tightening actions are in line with what Bebbington and Larrinaga (2011) indicate as the 'wicked' nature of sustainable development problems requiring that 'solutions' are never permanent but are rather continually reworked. The non-permanent nature of 'solutions' that Bebbington and Larrinaga (2011) indicate gives room for a consideration of the context-based approach proposed by McElroy and van Engelen (2012).

There have been some 'rebound' responses to the change in the tax structure that should be noted. Some drivers, particularly those who favour large cars, can pay less tax if they opt out of the company car system and instead buy and drive their own car on business, claiming mileage and other car allowances. The tax positions on these other allowances have not been subject to eco-reform and so there is a danger of losing some of the environmental gains. This raises the important point that tax policies on business travel as a whole need addressing rather than just company cars.

A significant emerging trend is that the tax structure looks set to particularly favour plug-in hybrids and could well tip the balance to making this the dominant clean vehicle technology. Possibly more by accident than design, this could make sense as the sustainability credentials of hydrogen fuel cell vehicles are increasingly open to question. Because company cars are such a large proportion of the new car market, the tax system could end up setting the UK's technological trajectory.

However, there is a serious concern that the 2012 decision to phase out the 0%, 5% and 10% step change bands has come too soon and will impede the uptake of low carbon vehicles. It is significant to note that the policy summary of impacts of this decision (HMRC 2012) included economic, exchequer, household and equality impacts, but not environmental impacts. It merely says under 'Other impacts' that 'No other impacts have been identified'.

Strategically, there is a more fundamental issue that, however useful these impacts have been, they have not necessarily set a path that will radically reduce carbon emissions from cars. Given the UK target of 80% reduction in carbon emissions by 2050 and with presently 24% of carbon emissions attributable to the transport system (DECC 2010), tax reform of company cars is not really that radical and will not set us on a path to deliver transport sustainability. To do that will require more radical system changes to business travel (Roby 2010), and probably a substantial reduction in the use of company cars as a whole.

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