

**Reducing greenhouse emissions from transport
UK project by MTRU
Discussion note 2
Environmental duties to encourage more efficient cars**

Introduction

UK transport policy in relation to reducing greenhouse gas is guided by the target of 60% reduction on 1990 levels by 2050. As the 2004 transport White Paper says, “real progress” should be made by 2020. Policies for promoting sustainable travel and demand management are intended to support this. Overall it is expected that transport carbon emissions will rise by 10% between 2000 and 2010, and then start falling by about 1% per year. This depends upon improved fuel efficiency.

The UK Government, the European Union, and the Japanese and Korean car manufacturers, are all agreed about targets for more efficient cars, at least until 2008. In an earlier Discussion Note, the failure to achieve the target and the flaws in its design were set out, and thus alternatives must be sought. There are two possibilities: the first is some form of regulation and rationing by Government of vehicle manufacture or fuel use. The second is to lead the market in a new direction by pricing policy. Given the problems with the first, the focus in this paper is on pricing. In any case, pricing will strongly support the achievement of any mandatory standards.

Clear objectives

For the purposes of formulating policy, there are a few basic criteria which pricing mechanisms for environmental purposes (as opposed to general taxation) should follow.

- 1 The main objectives must be individually identified and clearly stated. (*Rational*).
- 2 It must be clear to those who are affected how the mechanism relates to the objective. (*Transparent*).
- 3 It must be clear to those who are affected that there is a feasible course of action which will avoid the additional cost. (*Avoidable – a zero cost option is available*).

In this case the underlying overall objective is to reduce the greenhouse gas emissions from transport. The timescale and pattern of this reduction is the subject of another discussion note.

The specific objective, in this case, is to improve the efficiency of the UK car fleet. Commercial vehicles will be considered separately.

There are two important constraints to the specific objective. The first is that making vehicles more efficient should not produce more travel and thus fail to achieve the overall objective. In fact, national traffic forecasts currently assume that at least part of the predicted increase in traffic is due to motoring

costs falling. At least half of this is due to an assumed increase in car efficiency making driving cheaper, and thus encouraging more of it.

The second constraint is that increasing the rate of manufacture, in order to replace existing cars with more efficient models, would cause a serious increase in carbon produced. About 15-20% of the total carbon emitted during a car's lifetime is from its manufacture.

Integrated approach

Thus the financial structure proposed here covers the two main factors influencing purchase – the initial cost and the ongoing fixed cost (Vehicle Excise Duty). This is matched with an increase in fuel duty such that the efficiency gains do not result in a cheaper cost per mile for driving. Such gains would inevitably generate more traffic and undermine any reduction in emissions.

Large scale inducements to scrap older cars which consume a lot of fuel were considered but have their own problems. Apart from distorting the second hand car market, early scrapping means that extra carbon will have to be used to manufacture more new cars.

However, there is some merit in having a scrap value in terms of carbon emission and it would be useful for other purposes. For example some cars are sold at the absolute margins of safety and efficiency at very low prices. This would tend to be reduced if owners could receive a modest sum which would also cover the removal of a vehicle.

Thus the main thrust of the proposals is a new car sales levy, which does not apply to the most efficient vehicles, together with a phased increase in fuel duty and a revised annual VED.

The inclusion of the sales levy is for the simple reason that it applies directly to the purchase decision. To do the same through VED would require much more draconian increases. This is because people would tend to discount the value of the VED in future years – a principle which is widely accepted in all financial appraisal. In addition an emphasis on VED would do little to discourage use.

This illustrates a further important benefit in adopting an integrated approach. Using one mechanism to achieve significant change means the level at which it is applied will have to be very strong, and the risk of failure, for example through unforeseen side effects, is high. A basket of policies which support each other will mean each can be applied at a more moderate level and the risks are reduced.

Thus the sales tax is supplemented with the fuel duty increase and VED reform. A guaranteed scrap value is not central but is considered to be beneficial. A summary of the new charges is shown in Figure 1 below and each new charge is considered in more detail in the following sections.

Figure 1 National policies for improving vehicle efficiency

	<i>New emissions based sales levy</i>	<i>Annual Vehicle Excise Duty (VED) reform</i>	<i>Fuel duty increase</i>	<i>Scrappage payment</i>
New car market	Impact: direct. Supports purchase of efficient cars, phased in to allow sufficient availability of suitable vehicles. Levy avoided completely on vehicles with agreed lower level of gms/km.	Impact: indirect. Annual standing cost particularly influences low mileage purchasers (e.g. second or third car owners in a household). May influence depreciation rates which in turn affect new car purchase.	Impact: indirect. Will influence high mileage and generally cost aware, and/or environmentally motivated purchasers, most.	Impact: very low
Pre-owned car market	Impact: indirect Impact will depend on how the levy affects depreciation rates, thus some uncertainty. Volume of sales not predicted to change significantly except for cheapest cars (see scrappage).	Impact: indirect. Stronger effect than on new car market because annual costs greater proportion of total costs. Likely to be greater depreciation on inefficient vehicles to compensate for VED (and fuel duty).	Impact: indirect. Stronger effect than on new car market because annual costs greater proportion of total costs, and greater than VED. Likely to be greater depreciation on inefficient vehicles to compensate.	Impact: indirect. Supply of very cheapest cars reduced slightly. These tend to be the least mechanically sound and most polluting and sold "on-street". Thus amenity and safety benefit. Supports recycling.
Vehicle use	Impact: direct More efficient vehicles may reduce cost per mile of use and thus encourage more car driving (but see fuel duty).	No predicted impact.	Impact: direct Reasonably clear relationship between fuel used and distance travelled. Congestion, road costs and safety benefits.	Impact: indirect. There will be a small reduction of use because very cheap, marginally usable vehicles will be less available. There should be a safety benefit.

All the proposals have a recognisably common structure in their approach to taxing carbon emissions. This is important to achieve the transparency requirements of any new charges. They all include low or zero rates for the most efficient vehicles. The definition of the most efficient vehicle changes over time to reflect the introduction of new technologies. The time horizon given here is up to 2020 and the level of efficiency proposed is within existing capabilities of the major car manufacturers. The key aim is to give them certainty to plan the production of more of the efficient vehicles. Ironically, this should result in the achievement of the voluntary target.

This improvement in vehicle efficiency is only part of the package needed to reduce carbon emissions from transport. This will not be achieved simply by making vehicles more efficient, but would be assisted by it.

Car sales levy

Information on the price sensitivity of car buyers is difficult to obtain because of commercial confidentiality. However, it is clear that there is some evidence from the taxation treatment of company car purchase. Company cars represent 56% of all new car purchases.

Ten years ago newly bought company cars had engines about 10% larger than private cars (the precise grams of carbon per kilometre figures were not available then). The picture today is very different – newly bought company cars are about 3% more efficient than those bought privately. One of the reasons for this is the rapid switch to diesel cars, 44% for new company cars compared to 27% for private buyers. This is despite a small diesel surcharge in the company car tax system.

One of the key reasons for this is the introduction of a CO₂ based tax on company cars in 2002. A taxable benefit is calculated, based on the cost of the car, adjusted according to how efficient it is. The percentage of the car's cost which is taxable ranges from 15% to 35% and cars which emit less than 120 gms/km will go down to 10% in the 2008/9 tax year. The percentage increase is fairly smooth, rising by 1% for every 5 gms of extra carbon produced. There is an added complication, in that higher rate tax payers pay more since the taxable benefit of having a company car, calculated as above, is treated as though it is income. Employers are charged as well as employees through national insurance contributions, and there is the additional issue of employees paying tax on free fuel. For this, and other reasons it is difficult to establish a clear formula for how the level of price influences the choice of efficiency. However, the principles are there, and the approach has proved to be effective.

Thus the proposal set out in this document adheres to the principles set out earlier, that it should be rational, transparent and avoidable. In addition, the experience of the company car system has been used in the creation of the general level of the charge. Clearly the impact would have to be closely monitored over the first few years to adjust the level of charge. There has also been some interplay between people giving up company cars, receiving a

mileage allowance instead, and then buying a large car privately. Having the two systems more in tune with each other would avoid such market distortions.

Two options were considered for a sales levy, one as a percentage of the new car value, the other as a cost per extra gram of carbon emitted. The latter is preferred in terms of the rationale and transparency of the new charge. Thus the proposal has no banding and applies a constant charge per gm/km (£50) over a reasonably efficient present day car (140 gm/km). Below this level it has a zero additional charge. Rebates for more efficient cars have not been proposed because this would undermine other policies to reduce car use. The definition of an efficient car gets tighter over time. In principle, there should be no ceiling, in other words every extra gram counts the same. Some further work is needed to decide whether an interim ceiling should be used to allow more time for the high consumption market to adjust. This has been included in the chart below.

Relationship with EU targets

It should be noted that the starting point for the tax charge is co-ordinated with the long standing EU target for 2012 of 120gm/km as the average emission rate for new cars. The most recent Commission proposal has suggested a compromise level of 130gm but to be a mandatory standard. It also states that the shortfall will be met by increasing use of bio-fuels. While these can make a contribution to reducing carbon emissions, this depends completely on which crop is used, whether crops have to be imported, how the fuel is made and how much energy is used for this purpose, and how much carbon is emitted by the transport which is involved. The contribution of bio fuels needs to be considered separately and is not nearly as clear cut as improving vehicle efficiency.

In view of the need to make as great reductions as possible, as quickly as possible, there is no reason to change the charge levels in this proposal. These will create market mechanisms to encourage achievement of the efficiency targets. A mandatory 130gm level, and a tax regime which applies a charge only on the least efficient vehicles, are mutually supportive.

There are also EU proposals to remove all car sales taxes in the long term, and to relate them to carbon emissions in the short term. The proposal here is that sales tax should be zero at the target efficiency level and is believed to be consistent with this proposal.

EU studies of the additional costs of manufacturing efficient vehicles vary but achievement of the 120gm standard may cost about £1000, translating into about £1600 in the showroom. Again the scale of the car sales levy proposed is at or around the level needed to encourage manufacturers to apply the available technological solutions, and to develop them further.

**Table 1: Draft car purchase levy
Preferred option**

New car carbon levy @ £50 per gm per km over target average		2007/8	2008/9	2016/17	2020/21	
Actual charge 2007/8 at lowest in band	Actual charge 2020/21 at lowest in band					
0		Under 140	Under 135	Under 90		
0	£50	140-144	135-139	90-94		
0	£300	145-149	140-144	95-99		
0	£550	150-154	145-149	100-104	Under 90	
0	£800	155-159	150-154	105-109	90-94	
0	£1050	160-164	155-159	110-114	95-99	
0	£1300	165-169	160-164	115-119	100-104	
£50	£1550	170-174	165-169	120-124	105-109	
£300	£1800	175-179	170-174	125-129	110-114	
£550	£2050	180-184	175-179	130-134	115-119	
£800	£2300	185-189	180-184	135-139	120-124	
£1050	£2550	190-194	185-189	140-144	125-129	
£1300	£2800	195-199	190-194	145-149	130-134	
£1550	£3050	200-204	195-199	150-154	135-139	
£1800	£3300	205-209	200-204	155-159	140-144	
£2050	£3550	210-214	205-209	160-164	145-149	
£2300	£3800	215-219	210-214	165-169	150-154	
£2550	£4050	220-224	215-219	170-174	155-159	
£2800	£4300	225-229	220-224	175-179	160-164	
£3050	£4550	230-234	225-229	180-184	165-169	
£3300	£4800	235-239	230-234	185-189	170-174	
£3550	£5050	240 & over	235-239	190-194	175-179	
	£5550		240-249	195-204	180-189	
	£6050	Note. Charging could be extended if required to cover all cars, or ceiling slowly raised as in this table.	250 & over	205-214	190-199	
	£6550				215-224	200-209
	£7050				225-234	210-219
	£7550				235-239	220-229
	£8050				240-249	230-239
	£8550				250-259	240-249
	£9050				260-269	250-259
	£9550				270-279	260-269
	£10050				280-289	270-279
	£10550				290-299	280-289
	£11050				300-309	290-299
	£11550					300-309
	£12050				310-319	

For comparison:

In 2006/7 a £50,000 company car emitting 240 gms/km would incur a tax charge of £7,000 for a higher rate taxpayer plus about £900 to the employer.

Draft fuel duty increases

The targeted increase in fuel efficiency of the average car is 62.5% between 2006 and 2020. This results in the total vehicle stock in the UK achieving an efficiency increase of 42.2%. The fuel duty increases in the Table below have been designed to match this (including the addition of VAT) so that there is no overall incentive to increase travel by car. The less efficient the car, the greater will be the incentive to its owner to use it less. This is consistent with the overall policy objective.

In revenue terms, if motorists drive the same distance as today in their more efficient vehicles, the revenue from fuel duty will stay the same and their fuel costs per mile will stay the same. It should be noted that all the figures are in 2006 prices (no allowance made for inflation).

Thus this proposal is not the same as the fuel escalator, where increases used a fixed percentage increase in duty every year. The introduction is phased, to allow more time for new cars to enter the fleet, but this must be accompanied with a clear commitment to follow the pattern through until 2020. This will enable car owners to make secure long term choices.

Table: Changes in fuel duty to balance fuel efficiency

Year	Additional fuel duty in p/litre	Base price in p/litre	New price in p/litre	% increase in total price on base year	% increase in total price on previous year
2007	1	89	90	1.3%	1.3%
2008	2	89	91	2.6%	1.3%
2009	3	89	93	4.0%	1.3%
2010	5	89	95	6.6%	2.5%
2011	7	89	97	9.2%	2.5%
2012	9	89	100	11.9%	2.4%
2013	11	89	102	14.5%	2.4%
2014	14	89	105	18.5%	3.5%
2015	17	89	109	22.4%	3.3%
2016	20	89	113	26.4%	3.2%
2017	23	89	116	30.4%	3.1%
2018	26	89	120	34.3%	3.0%
2019	29	89	123	38.3%	2.9%
2020	32	89	127	42.2%	2.9%

Notes

The above duty increases have been increased by VAT @ 17.5% to provide the new prices and % increase figures.

Fuel duty is currently 47.1p per litre.

If the fuel duty escalator had continued in place at 6%, the total duty would now be 83.9p per litre (Treasury Written Answer 13/09/2006)

Annual ownership charges (Vehicle Excise Duty)

The current system of annual duty is based on carbon emissions but in a small number of bands. These are different in size and charge most per gram (£2) at the most efficient end of the spectrum. All cars over 226 gms/km pay the same so there is a zero charge for extra carbon produced. There are two other sets of VED rates for older cars. As the Society for Motor Manufacturers and Traders (SMMT) point out, such mixed systems, the tapering of the carbon value and differences between systems lead to confusion and mixed messages.

While VED is a secondary signal to new car purchase and car replacement, it needs to be consistent with other charges. Although reforming it yet again may be confusing, there needs to be a firm basis on which it will go forward within the time horizon of these proposals (to 2020).

The level of VED should not be used as the key to influencing behaviour because it only indirectly influences the decisions which determine carbon emissions. These two important decisions are:

- efficiency of the vehicle at the point of purchase
- how much to use it to fulfil travel requirements.

Altering both the structure and the rates of VED very significantly for new cars without retrospective changes for existing vehicles could cause people to hold on to older less efficient vehicles. The increased fuel duty would help to avoid this and there is some merit in people maintaining older cars if their mileage is very low. This is because the carbon cost of manufacturing a new one is avoided.

For these reasons the proposal here is to reform VED by applying a single rate per gm/km of £2 to all cars above the reference level used for purchase. This would not be retrospective. The lowest charge would be £20. This results in a small but positive change for the most efficient cars and a small but more noticeable increase for the least efficient vehicles. The average car sold today would pay slightly less than under the current system. A vehicle emitting 300 gms would pay £400 instead of £210. Taken together with fuel duty, this represents on average a move towards charging more for use. Again there is the zero cost option of owning an efficient vehicle.

One area for further discussion is how this proposal is far less draconian than some proposals for VED reform on carbon emission grounds. The key reasons are that an impact is sought first at the point of purchase and secondly on vehicle use. This appears at first sight to be both more efficient and more equitable.

References

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