Effect of a Pay-As-You-Drive charge on the adoption of lower carbon vehicles

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Energy Policies in a Global Context

A new approach to designing effective low carbon car taxation

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Scope and objectives of presentation

- 140 gCO_2/km ACEA target unlikely to be met (T&E 2006)
- UK annual gCO_2/km reduction = 1.1% (SMMT 2006)

- How can we increase rate of adoption of lowC cars?
- Focus on attitudinal response to price signals
- Propose graduated distance/PAYD charge (p/mile)
- Quantify impacts of PAYD charge

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Attitudes to the environment

- Awareness and concern about climate change >75%

'Attitude-behaviour gap'

Drivers are just as likely to be very concerned for the environment even if they drive a highly polluting vehicle

What interventions are most effective?

- Vehicle Price
- Fuel consumption
- Size/Practicality
- Reliability
- Comfort/Safety
- Running costs
- Style/Appearance

Car purchase factors

- Depreciation
- Sales Package
- Dealership
- Environment
- Vehicle Emissions
- Road tax
- Alternative fuels

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DfT 2003; Walton 2004; DfT/ONS 2006

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Attitudes to emissions

- Air quality >important than climate change
- Moderate awareness / poor understanding of low carbon options
- VED band differentials:
  - ~£150 for 55% shift
  - ~£300 for 72% shift

Education/ information

Increase VED bands

- Vehicle Price
- Fuel consumption
- Size/Practicality
- Reliability
- Comfort/Safety
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- Style/Appearance

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DfT 2003; Bibbings/WCC 2004; LowCVP 2005

Attitudes to costs

- Few car buyers use 'mpg' when making purchase
- Costs too complex to compute (eg 'mpg' → p/m)
- Motorists use 'mpg' as a proxy for running costs and environmental impact
- Accept >£1000/yr increase in annual costs → smaller car

Increase transparency of 'mpg'-cost-CO_2 link

- Vehicle Price
- Fuel consumption
- Size/Practicality
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Kurani 2002; ; RAC 2004; LowCVP 2005; DfT 2006

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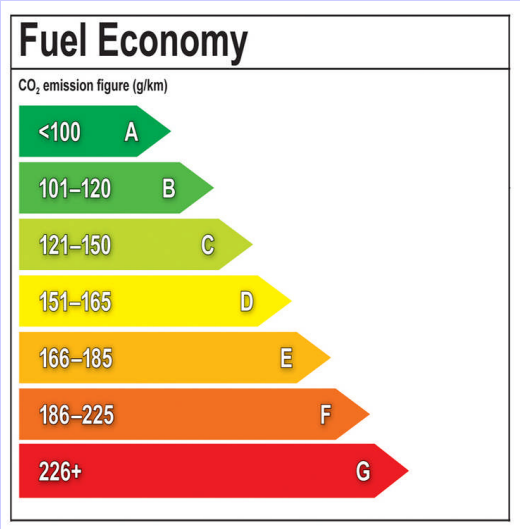
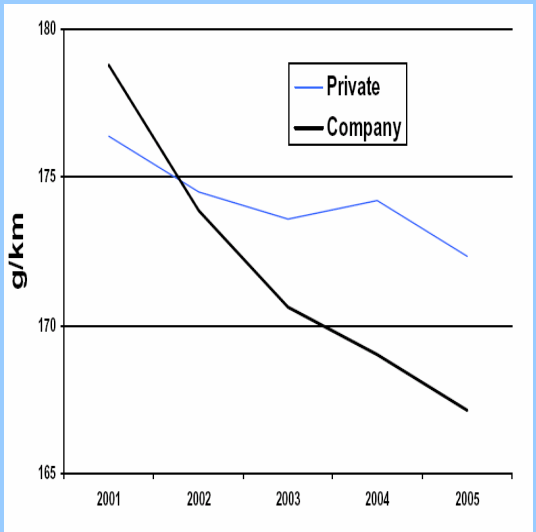
What works? Information



"Information, on its own, will only change consumer behaviour in a few exceptional cases"

(Bibbings/WCC 2004)

What works? Price signals



- Company car tax gradient ~£10/gCO_2-yr
- Increase cost elasticity -0.7→-1.0 (London CC)

(Santos 2006)

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Collins 2003; Demos 2003; Bibbings/WCC 2004; DEFRA 2005; Santos 2006

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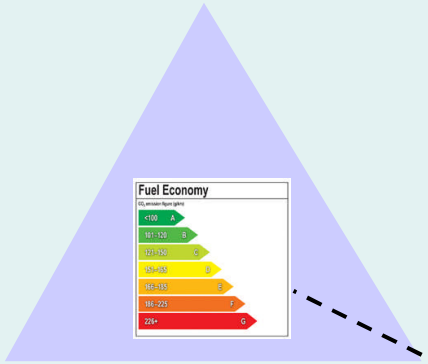
Aligning car tax with user attitudes

Vehicle price



FED **VED**

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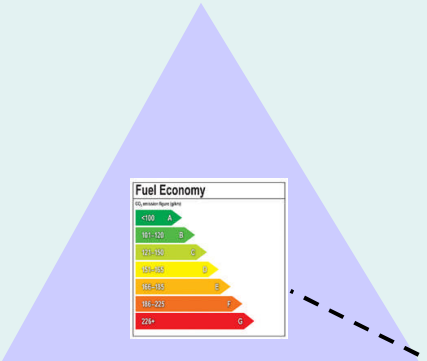
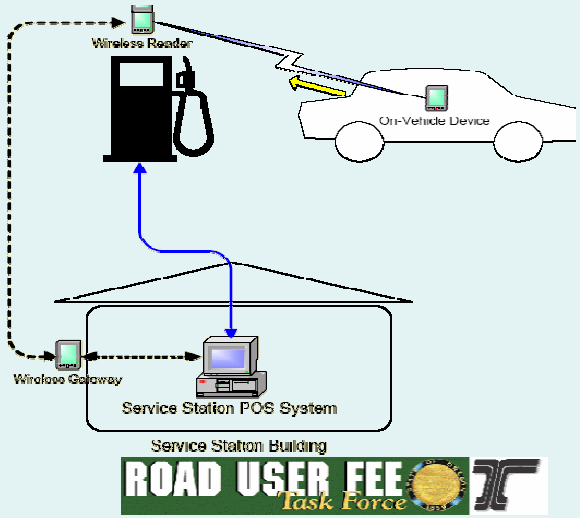
Aligning car tax with user attitudes

Vehicle price



FED



PAYD charge
banded by
vehicle CO_2

Shift revenue

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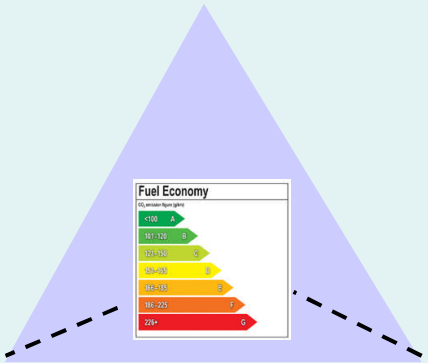
Aligning car tax with user attitudes

Vehicle price



Harmonise FED rates for all fuels

PAYD charge banded by vehicle CO_2

Shift revenue

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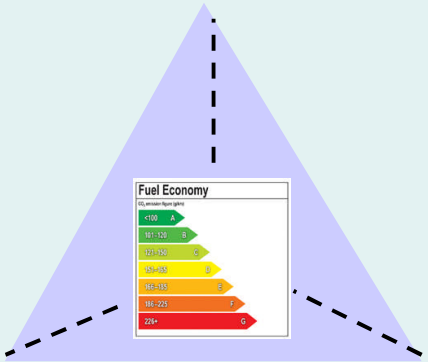
Aligning car tax with user attitudes

Self-financing system of
capital feebates



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PAYD charge banded by vehicle CO_2

Shift revenue

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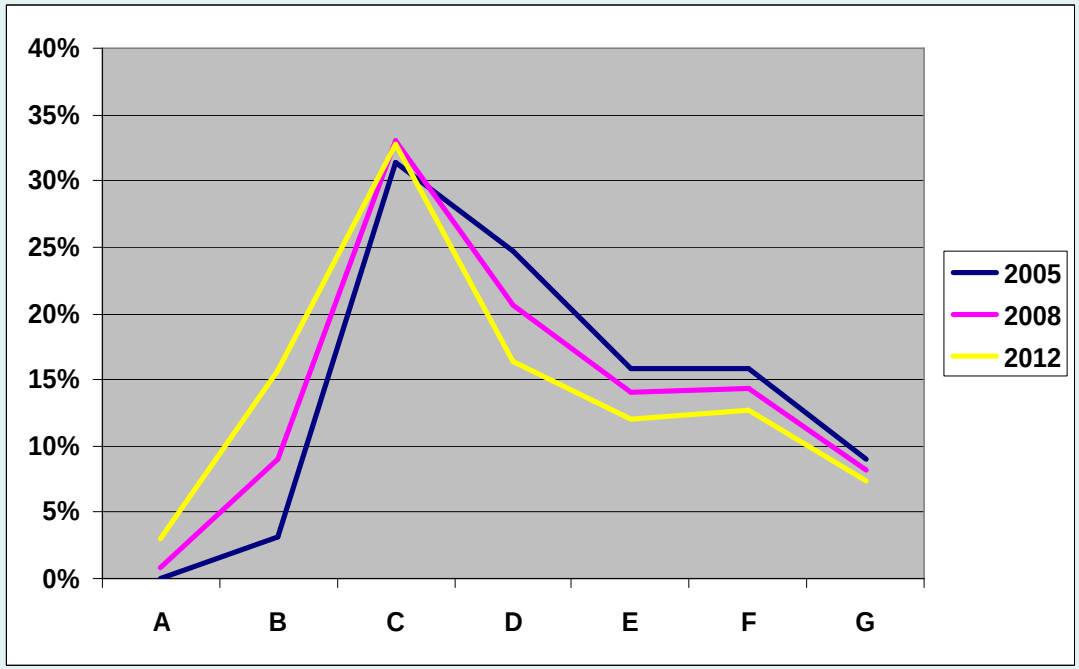
Modelling graduated PAYD charge

- 50% FED → PAYD graduated according to CO2.
- New registrations categorised according to fuel (petrol/diesel/alt) and VED Band (A to G).
- Calculate annual fixed, variable and total costs.
- 3 scenarios: (1) BAU (annual variable costs unchanged);
  (2) £10/gCO_2 (variable cost differential between VED bands inc. to £250);
  (3) £14/gCO_2 (variable cost differential between VED bands inc. to £350).
- 2 cost-behaviour elasticities: -0.6 VMT; market shift to lower VED band consistent with CCT impacts and ACEA projections.
- Estimate HMT Revenues, total carbon emissions and total VMT for 2005, 2008, 2012.

Impact of graduated PAYD charge

Additional	Graduated distance charge (p/m)							CO2 saving	Additional %
C-gradient	A	B	C	D	E	F	G	MtC/yr 2008-12	Band A 2012
£0/g	1.7	2.4	3.4	4.0	4.6	5.5	6.6		



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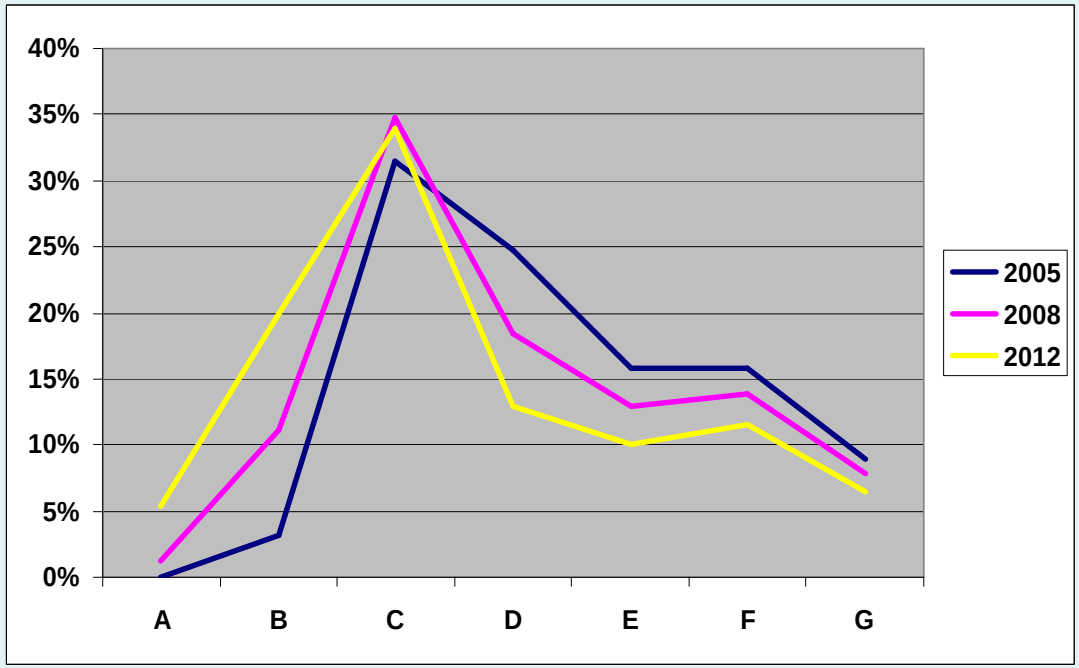
£10/g	-1.6	0.0	3.0	5.9	8.7	11.8	15.1	>0.3-0.5	2.2%



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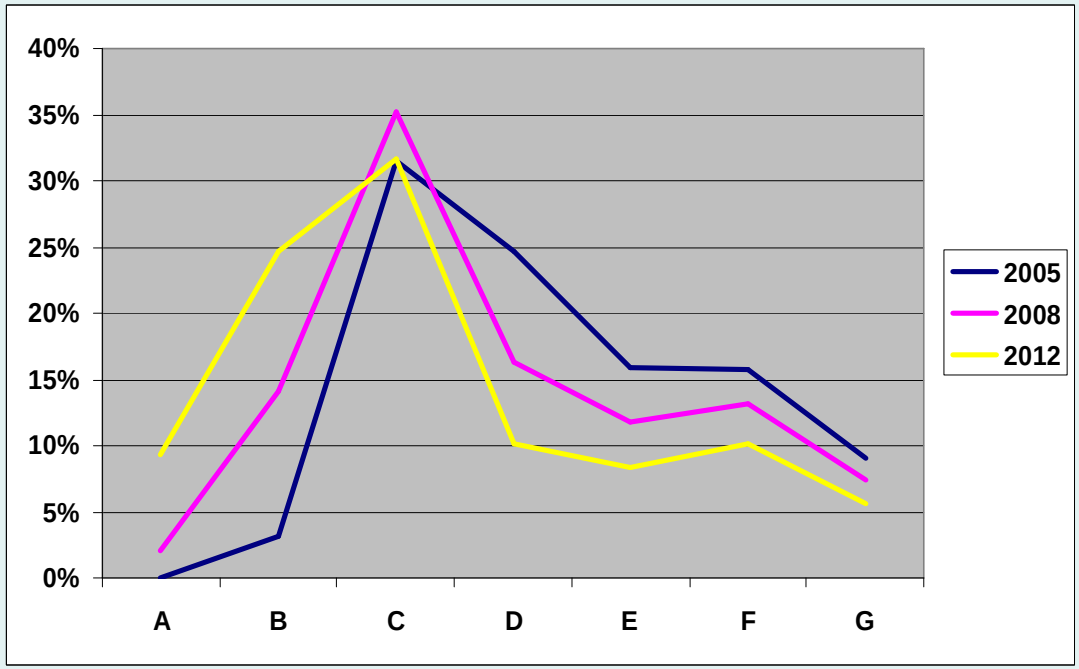
£10/g	-1.6	0.0	3.0	5.9	8.7	11.8	15.1	>0.3-0.5	2.2%
£14/g	-2.1	0.0	4.0	7.9	11.7	15.8	20.1	>0.6-1.0	6.2%



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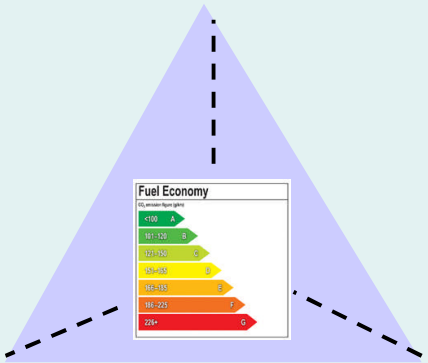
Impact of graduated PAYD charge - Summary

Self-financing system of
capital feebates

Additional revenue



Harmonise FED rates for all fuels

PAYD charge banded by vehicle CO_2

Shift revenue

Carbon offsets

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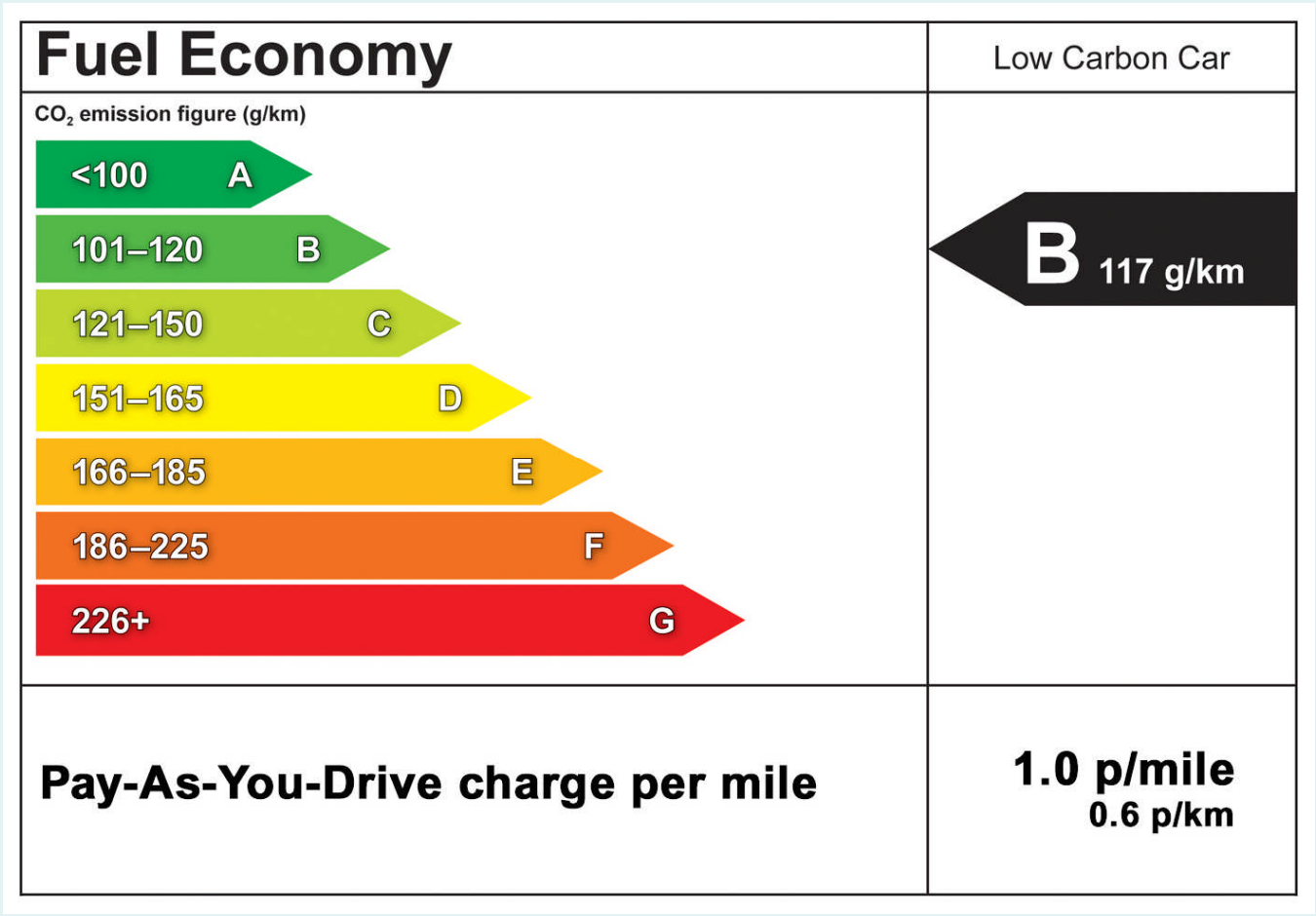
Impact of graduated PAYD charge - Summary



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