Labels of the Future

Green Global NCAP Labelling / Green Scoring Workshop
Global Fuel Economy Initiative

Gloria Esposito
Programme Manager
Low Carbon Vehicle Partnership
Gloria.Esposito@lowcvp.org.uk
**LowCVP Research Study – Testing Alternative Fuel Economy Label Designs**

**Aims**
- Improve presentation of financial information to demonstrate the benefits of fuel efficient cars
- Placing greater emphasis on MPG, less on CO₂
- Comparative information ‘in the model range’, integrate concepts of behavior science
- Inclusion of QR code
- Future proof - adapt for EV & PHEV

**Methodology**
- Designer created series of prototype label designs, two rounds of testing with consumers – focus groups and internet survey
- Consumer testing programme led by Ecolane Transport Consultancy 2012
Label Designs Tested With Consumers

Current label
x 1
Lose ‘framing’
x1

‘Slider’
Per mth slider
Per mth rank
Per mile
x 1

‘Dashboard’
Petrol
Diesel
x 3

‘Buyers Guide’
Petrol
Diesel
comparisons
x 5

‘Dashboard’
EV
PHEV
x 4

Mock up website created featuring a cost calculator, car comparison tool & additional information.
**CO₂ and Fuel Economy Information**

- Clear fuel description and symbol
- Very strong preference for clear and bold MPG info. MPG preferred metric in this context (to CO₂, VED)
- Very strong visual element – liked by all
- Prefer not to have CO₂ emission figures shown
- VED viewed in terms of cost not emissions – CO₂ least used information in this context
- Some confusion what ‘urban’ and ‘extra urban’ mean
- Some distrust about validity of test data in real world – but some acknowledgement that useful for comparisons
Introducing New Comparative Element

Most participants tended NOT to like 3 year comparisons – some distrustful that fuel and tax costs could be predicted over such a timescale.

Participants NOT in agreement about what ‘model range’ means – some have general idea but often confused with vehicle class.

Positive reaction to having info from independent source – add ‘authority’ – but DVLA, DfT can have same effect.

Liked seeing real comparisons – understood ‘worst’ and ‘best’.

Format issue – not clear that the figures above link to ‘this car’.
Fuel and Taxation Cost

Groups liked ‘pence per mile’ and ‘pounds per month’ in addition to annual costs

Strong support for DIAL FORMAT

Some evidence that vertical layout of cost data easier to read than horizontal

10k average mileage AND out-of-date fuel costs add to distrust about validity of cost data

Some noticed that VED rates different here – but very little awareness that first year rates now apply for new cars
Almost unanimous support for QR Code reader tools – whether knew about technology or not. Of the two types of tools tested, vast majority prefer the CALCULATE tool rather than the ‘flat’ information glossary.

'I was really impressed – I’ve never really used one of these before, and when we did the calculator I thought that was brilliant'
Plug-in Hybrid Label

Initial REEV label trialled at first R2 focus group showing ‘weighted combined’ fuel economy data as appears on the Certificate of Conformity.

VAUXHALL AMPERA
1.8 VVT-i T4 5dr

<table>
<thead>
<tr>
<th>TAILPIPE CO₂ EMISSIONS</th>
<th>FUEL CONSUMPTION</th>
<th>ELECTRICITY USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>235 MPG</td>
<td>13.0 kWh/100km</td>
</tr>
<tr>
<td>27 g/km</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Excise Duty (VED)</td>
<td></td>
<td>electric range: 40 miles</td>
</tr>
<tr>
<td>n/a urban</td>
<td>n/a extra urban</td>
<td>kilowatt hours per 100km</td>
</tr>
<tr>
<td>1.2 L/100km</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

Low understanding of electricity units leads to assumption that 235 MPG is the only fuel economy data for the Ampera – which then links to trust issue as few believe that car will travel 235 miles on a gallon of fuel.

Very low level of understanding of ‘Wh’ and ‘kWh’ units.
Exploring alternative ways to present ‘weighted combined’ MPG

PHEV/REEV labels trialled at remaining R2 focus group showing ‘weighted combined’ fuel economy data (Certificate of Conformity) AND/OR Condition A+B data as measured by EC R101 tests

Participants report information overload and incomprehension

Low level of understanding of ‘Wh’ and ‘kWh’

FUEL + ELECTRICITY CONSUMPTION

Weighted combined 1.2 L/100km
Electric range 83 km

13.0 kWh/100km

FUEL + ELECTRICITY CONSUMPTION

Weighted combined 235 MPG
Electric range 83 km

130 Wh/km

FUEL CONSUMPTION

Petrol only 56.5 combined MPG
Battery is in minimum state of charge and vehicle is ultimately propelled using petrol energy supplied to the vehicle

ELECTRICITY CONSUMPTION

Electricity only 149 MPG equivalent
Battery is in minimum state of charge and vehicle is ultimately propelled using electrical energy supplied to the vehicle

FUELS CONSIDERED TOGETHER 124 MPG equivalent

FUELS CONSIDERED SEPARATELY

1.2 L/100km Petrol

13.0 kWh/100km Electricity

Some preference for Condition A+B data equivalents

Some preference for overall MPG equivalent data

Some consumers mention ‘information overload’
Electric Vehicle Label

Majority confused about what ‘Wh’ means – more clearer about ‘km’ but most would prefer units in miles – Alternative to show MPG equivalent

Most wanted additional information about EVs as knowledge base was low – Info mentioned included driving range, recharge time and charging map

Majority of participants found this format clear (although many noted power-station emissions)

Groups that preferred p/mile comparison liked this for EVs as it enabled direct comparison with conventional vehicles – However, some commented that fuel costs only part of the total cost
Summary of Findings

- Dashboard most popular label design (existing least)
  *simplicity, modular design, key numbers & text seen from a distance.*
- MPG leading metric – but some distrust about validity
- CO₂ viewed primarily in terms of cost
- Pence per mile cost metric beneficial
- Demand for comparative data – colour coded bandings & dial formats
- Support for ‘worst/best’ cost comparison, require clearly marked numerical scales but some confusion model range terminology
- Independent branding add authority to label
- QR code very popular – calculator tool most useful
- EV/PHEV – little understanding of Wh/km and ‘weighted combined MPG’
- Demand additional info on EV charge time, range, location of charging points
What Could Future Labels Look Like?

Note: Designs hypothetical not tested with consumers
What Could Future Labels Look Like?

Need to be mindful of information overload, avoid by exploiting QR code.
New UK Plug-in Hybrid Fuel Economy Label

- UK introduce new electric and plug-in hybrid labels Feb 2013
- Explains how ‘weighted’ combined MPG is derived
- Weight combined MPG = Fuel (MPG) + electricity(m/kwh)
- Annual electricity & fuel cost
- EV Range
- URL to charging point map

Fuel Economy

<table>
<thead>
<tr>
<th>CO₂ emission figure (g/km)</th>
<th>VED band and CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 100</td>
<td>A 49 (weighted)</td>
</tr>
<tr>
<td>101-120</td>
<td>B</td>
</tr>
<tr>
<td>121-130</td>
<td>C</td>
</tr>
<tr>
<td>131-140</td>
<td>D</td>
</tr>
<tr>
<td>141-150</td>
<td>E</td>
</tr>
<tr>
<td>151-165</td>
<td>F</td>
</tr>
<tr>
<td>166-175</td>
<td>G</td>
</tr>
<tr>
<td>176-185</td>
<td>H</td>
</tr>
<tr>
<td>186-200</td>
<td>I</td>
</tr>
<tr>
<td>201-220</td>
<td>J</td>
</tr>
<tr>
<td>221-255</td>
<td>K</td>
</tr>
<tr>
<td>&gt;255</td>
<td>L</td>
</tr>
</tbody>
</table>

Fuel and electricity cost (estimated) for 12,000 miles
A guide price for comparison purposes is calculated using the combined drive cycle (town centre and motorway) and average fuel and electricity price.
Fuel consumption for plug-in hybrid vehicles is measured in two conditions, one with the battery freshly charged and another where it is significantly depleted. A weighted average of the two figures obtained is calculated based on an assumption that a vehicle is driven 16 miles (26km) beyond its maximum electric range, using the engine as required without recharging.
Cost is recalculated annually. Unit cost as at March 2012: petrol £1.39/litre, electricity 13.7p/kWh.

VED for 12 months
Vehicle Excise Duty (VED) or road tax varies according to the CO₂ emissions and fuel type of the vehicle.

Energy consumption: 134.5 Mpg and 11.9 Miles/kWh
Electric range: 16 Miles

LowCVP
low carbon vehicle partnership
What Further Work is Required?

- How to overcome consumer mistrust of MPG figures?
  
  *Include text on label explaining difference test v real world, web-based solution eg link to real-world MPG figures, improve test method*

- How to ensure consumers do not misinterpret ‘weighted’ combined MPG in plug-in hybrid label
  
  *Identify both fuel consumption and electricity consumption on label*

- How to make comparison of vehicle efficiency of different fuels and technologies easier for consumers
  
  *Use MPG equivalent or cost based metric eg pence/mile*

- How can labels integrate with an increasingly evolving digital media landscape?
  
  *Mobile apps, digital label, QR codes – what next?*

- Further testing with consumers to explore level of understanding and use of ‘future’ labels during the car buying process