Decarbonising The Automotive Industry

CO₂ regulation – Taking The Long View

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CO2 regulation – taking the long view

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Regulation = increased cost

What does this mean; what are these costs?
Costs =

• Increased expenditure on R&D and product development:
  – More engineering jobs
  – More IPR generated

• More money transferred to suppliers (car makers outsource 60-80%):
  – More engineering jobs
  – More IPR generated
EU leadership

• EU regulatory trajectory increasingly followed by others – e.g. China, India

• If EU leads on CO2 it can develop IPR for relevant technologies

• Which can then be sold to car manufacturers and suppliers elsewhere
Are these costs?...

...or benefits?
Employment in the car industry has been declining for a long time while markets grew…

…the effect of leaner operations, advent of IT, etc. = higher productivity

Jobs have been created by suppliers: e.g. emissions control = cost to car makers, but jobs for makers of catalytic converters

Typical labour input over product lifecycle

1. R&D – low level of highly skill labour
2. Product development – higher level of highly skilled labour
3. Production start – high level of semi-skilled labour
4. Maturity I – increasing automation reduces need for labour
5. Maturity II – move to low labour cost locations

Lesson: repeat phases 1 and 2 regularly to:
- Retain value added
- Retain high quality jobs
- Retain competitive advantage
e.g. Johnson Matthey

- Banking and commodities (precious metals)

- Now one of the largest suppliers of catalytic converters:
  - IPR generated
  - Jobs created
  - Profits generated
commodification

Business as usual
- Danger of commodification
- Hence erosion of margins
- Loss of differentiation

Tighter regulation Avoids commodification by:
- Increasing engineering input
- Enhancing added value
- Enhancing differentiation
- Enhancing margins
130 g/km – a challenge?

A recent advertisement by European Federation for Transport & Environment highlights the apparent lack of technological progress.

1948: 7.5 litres/100km

2008: 7.5 litres/100km

60 years of progress?

MEPs – It’s time to shift fuel efficiency up a gear.
Vote for 120g CO₂/km by 2012 and 80g CO₂/km by 2020.
www.forlesspollutingcars.com

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130 g/km is not rocket science; available today:

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Models</th>
<th>CO2 (g/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMW</td>
<td>MINI d, 316</td>
<td></td>
</tr>
<tr>
<td>Citroen &amp; Peugeot (PSA)</td>
<td>C1, C2, C3, C4, 1007, 107, 207, 206, 307</td>
<td>109-129</td>
</tr>
<tr>
<td>Fiat</td>
<td>Panda, Grande Punto</td>
<td>114-122</td>
</tr>
<tr>
<td>Ford</td>
<td>Fiesta, Focus, Focus C-Max</td>
<td>114-129</td>
</tr>
<tr>
<td>Honda</td>
<td>Jazz, Civic Hybrid</td>
<td>109-129</td>
</tr>
<tr>
<td>Hyundai-Kia</td>
<td>Amica, Picanto, Rio, Cerato</td>
<td>121-129</td>
</tr>
<tr>
<td>Mazda</td>
<td>2, 3</td>
<td>124-128</td>
</tr>
<tr>
<td>Mercedes-Benz, Smart</td>
<td>A-class, For2, For4, Roadster</td>
<td>90-128</td>
</tr>
<tr>
<td>Mitsubishi</td>
<td>Colt</td>
<td>126</td>
</tr>
<tr>
<td>Renault &amp; Nissan</td>
<td>Clio, Modus, Megane, Micra</td>
<td>115-126</td>
</tr>
<tr>
<td>Opel-Vauxhall</td>
<td>Corsa</td>
<td>124</td>
</tr>
<tr>
<td>Toyota-Daihatsu</td>
<td>Aygo, Yaris, Prius, Charade, Sirion</td>
<td>104-127</td>
</tr>
<tr>
<td>Volkswagen, Skoda</td>
<td>Polo, Fabia</td>
<td>124-127</td>
</tr>
<tr>
<td>Volvo</td>
<td>C30 1.6d, S40 1.6d</td>
<td>129</td>
</tr>
</tbody>
</table>
The problem of averages
130 g/km is not rocket science; < 80 g/km might be – for today’s car industry at least

The most fuel efficient vehicles you can buy today (around 80-90 g/km) are very small …

and far from any average today’s customers would find acceptable
Technically 130g/km is possible, but it may create a split in the market...

**130 g cars**

- Current 130g cars
- Current 150g cars with reprogrammed engine management software
- Current 180g cars with improved powertrain

All at low or zero cost over today

**Larger cars**

- In order to contribute to the average of 130g these will have to become
  - much lighter – use of esoteric materials
  - Much more energy efficient – alternative fuels & powertrain (e.g. IC-electric hybrid)

At considerably higher cost compared with today
Industry often blames the customer.

But (s)he can only choose from what is available.
Incentives can work – e.g. UK

- CO₂-based road tax (VED) regime
- CO₂-based company car taxation system
- Incentives for alternative fuel vehicles
- Fuel price escalator (dropped 2000)
So how would this pan out under the forthcoming CO2 regime?
VED band split forecast to 2027
Rationale

- Vehicles currently in Bands D and E can mostly be adapted to meet requirements for band C, hence these segments will be squeezed.
- Band G will disappear, but F will survive to accommodate the few remaining ‘gas guzzlers’, together with the smaller bands D and E.
- New product will be developed for bands A and B. Band A will see new plug-in-hybrids and very light-weight IC vehicles.

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10 g/km ‘by other measures’

- Other technical vehicle measures should be part of the 130g/km effort.
- Low rolling resistance tyres and low friction lubricants could become the mandated standard
- Biofuels, hydrogen, etc.:
  - No or low incentive for flex-fuel vehicles
  - Lower fuel duty for biofuels and $H_2$ certified as sustainable
  - =>Incentivise fuels not vehicles (better guarantee that lower carbon fuels will actually be used)
Are the changes needed too radical?

- For car makers - yes
- For consumers - possibly
- For government - yes
- For NGOs – no  
  (it is not their money)

Reasons/excuses:

- Cost
- Car makers lobbying
- Jobs
- Society’s innate conservatism

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FoE survey shows consumer support
(source: www.foeeurope.org/cars/Poll/Results_by_country.pdf)

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel prices affect my household finances</td>
<td>72</td>
<td>22</td>
</tr>
<tr>
<td>Fuel consumption is now most important buying factor after price</td>
<td>64</td>
<td>36</td>
</tr>
<tr>
<td>Measures to make car manufacturers reduce fuel consumption by 25% should be introduced urgently (and most say they are prepared to pay 6-20+% more for these cars)</td>
<td>87</td>
<td>11</td>
</tr>
</tbody>
</table>
Industry’s choices are limited:

Compliant
- Try and fight regulation
- Respond to regulation once introduced

Strategic:
- Try and shape regulation
- Lead solutions and shape markets to your competitive advantage

Environmental regulation is Inevitable; it reflects social concerns and priorities
e.g.: The US market – who makes money?

**Environmentally strategic**
- Toyota
- Honda

**Environmentally reactive**
- GM
- Ford
The future - Unpredictable?

the future does not just happen; we make the future today
An opportunity to move towards a more sustainable car industry

- Radically change the product
- Radically change the business model
- Reward people as much for meeting environmental and social as financial targets
If we are guided by sustainability

• Our vehicles could be:
  – Lighter
  – More fuel efficient
  – More fun to drive

• Our car makers could be:
  – More profitable
  – Less material dependent
  – More sustainable

• Although:
  – Car use may be more restricted
  – And we may not be able to replace them as often
  – Car makers would make fewer cars and sell mobility services tailored to customer needs and wants
  – Existing players unable or unwilling to adapt will disappear

(Picture courtesy of Velonova, NL)
The End – Thank You For Your Attention