Cars and CO2 – a clash of cultures?


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About me

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Reconciling car and sustainability

Key Publications:
1994: Motor Vehicles in the Environment
1997: The Death of Motoring?
2003: The Automotive Industry and the Environment
2006: The Business of Sustainable Mobility

Teaching:
- MBA International Automotive Industry Management
- PGDip, Motoring Journalism
- MSc International Transport & Sustainable Business
- 2 annual lectures to final year engineering students
- Member Foresight Vehicle External Advisory Panel
- Member Motorsport development UK Research Group
- Member Society of Automotive Historians
- Affiliate member Institute of the Motor Industry
- Member, Guild of Motoring Writers
First a quote:

“Although the auto industry has made progress, it falls far short of sustainability”

A century ago the car was seen by many as a cleaner alternative to the horse...

In London alone, around 5000 tonnes of horse manure had to be removed from the streets each day!
History of Regulatory Concerns

- Crankcase emissions (1950s)
- Tailpipe emissions (60s-00s)
- + VOC emissions (80s-00s)
- + CO2 emissions (90s-00s)
- Sustainable development (90s-00s)
- Sustainability/Life Cycle Analysis (00s)
Understanding Sustainability

Thomas Jefferson (1789):

“Then I say the Earth belongs to each...generation during its course, fully and in its own right, no generation can contract debts greater than may be paid during the course of its own existence”

Theodore Rooseveltt (1890s):

“The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired in value”
Our responsibility to future generations…

… But how well does the car industry really understand the concept of sustainability?
Sustainable development; a 3-way balance?
(source: Wikipedia)
Herman Daly (1995, 1999):

"In my view everything depends on which paradigm one accepts: the economy as subsystem or the economy as total system"
A clash of cultures:
• Do economic laws ever override the laws of nature?

• ...or is this like believing the sun moves around the earth? – the establishment view only a few centuries ago (the people in charge are not necessarily right, or clever!)
Sustainability – the big Picture:
Industry’s perspective is often too reductionist

SUSTAINABILITY

ELV
Materials, pollution
= technical problems
engineering solution!
The people problem

• People hate complexity! – reductionism makes things easier

• Car companies employ very few environmentalists or sustainability experts

• People in companies often recruit people like themselves

= intellectual monoculture
  = lack of diversity
  = a vulnerable ecosystem
The people problem

- Lack of imagination on all sides:
  - Environmentalists: ban cars
  - Car industry: cannot redefine the car
  - Your customers are people too; making irrational decisions

- Inability to imagine different futures – change happens fast; could you sell this today? – you could only just over a generation ago:
However, regulators and politicians…

…are equally guilty of this narrow focus, and the current favourite is…
That CO2 thing – 130 g/km?

February 2007: EU Commission, DG Environment proposes introduction of regulation to reduce new car emissions to average of 130g/km by 2012.
The scary bit: CO2 in our atmosphere
(800-2000ad)
But, has this not happened before? – nothing to worry about…

- Sure, but…:
- not in 450,000 years (Al Gore’s graph):
- 500 million years - our planet can handle high levels of CO2 – can we?
But, can we be sure of the science? - NO

• Climate modellers have limited budgets

• We can only ever be sure of science with hindsight – after we experiment

• Many decisions in life are taken without 100% certainty

• Business is about taking risks
Confusion caused by language:

‘saving the planet’ – the planet can look after itself – but can we?

It is OUR environment we are saving
Industry’s response:

cost,

jobs,

can’t be done

• GM, Ford and Chrysler consistently resisted environmental regulation in the US – Honda and Toyota did not; and look what happened to them!

• The abolition of the slave trade was resisted because of expected job losses
Jobs?
(at Renault; source: Loubet 2001, 449)
More regulation

= more technology
  = more engineering input
    = more engineers needed
      = more intellectual property created
        = protect EU advantage

Avoids commodification, hence transfer of jobs outside EU is less, not more likely
Cost?

<130 g/km cars you can buy today

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Models</th>
<th>CO2 (g/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chevrolet</td>
<td>Matiz 0.8 S</td>
<td>127</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>
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<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>
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<tr>
<td>Volkswagen, Skoda</td>
<td>Polo, Fabia</td>
<td>124-127</td>
</tr>
<tr>
<td>Volvo</td>
<td>C30, S40</td>
<td>129</td>
</tr>
</tbody>
</table>
The problem of averages
Is average figure the right approach?

Does the climate system understand averages?

or only total amounts?

E.g.:

Volvo:
- average 2005: 195g/km x 224,415 cars = 43.7t/fleet km

Fiat:
- average 2005: 139g/km x 681,613 cars = 94.7t/fleet km

- And this is just EU, not global

(source: European Federation for Transport and Environment, 2006)
The role of government
“But we only make what the customer wants”

The customer can only buy what the industry supplies

...but can be influenced by incentives
Incentives needed: 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)
For sustainable automobility more radical change is needed

After making manufacturing ‘lean’, can the industry make its products ‘lean’?
We need to abandon McDonough’s design principle of the 1st industrial revolution:

- Technology is not the whole solution, but technology is part of the solution
- Other elements (barriers?) are social, political and psychological

“If brute force is not working, you are not using enough of it!”
(William McDonough)
We have to change the car itself

• We need to redefine automobility = motorised personal mobility

• And also the best business models to deliver it

• We need to redefine the car

• Considering both structures and powertrain...
…new, better powertrains…

Enjoy the conference!
Thank you for your attention – may we all drive happily ever after

(courtesy VeloNova)