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Audi R10





MIA Clean Racing Conference 2003

“Motorsport needs to engage with the automotive industry in a new and relevant manner.....seeking shared goals that relate to real world problems ...”

.....Herb Fishel, formerly Head of GM Motorsport



Global environmental and fuel situation

- **Global Warming – brings a need for**
 - de-carbonised fuels
 - reduction of fuel consumption and emissions
- **Security demands a reduction in dependency on Foreign Oil**
 - 100% Japan
 - 75% Europe
 - 65% USA
- **Underlying Overall Concern**
..... **Oil is a Finite Resource**



- The case for **Energy Efficient Motorsport** is now established
- A range of alternative fuels, important for future road applications, can be raced today
- The sport can encourage the energy efficient route through new technical regulations which reward winners
- Efficiency can be enforced by limiting fuel supply and flow
- Touring car and long distance sports car racing (Le Mans) offer the very best opportunities



Seat TD1 WTCC





- An energy efficient motorsport industry will...
 - Secure its own future
 - Be more relevant, technically, to OEMs, energy companies and new industries so encouraging greater investment
 - Help promote and deliver environmentally friendly, future road transport



Motorsport acting as an energy efficient marketing activity

- Motorsport has years of experience successfully.....
 - Developing and Implementing new Technology and Engineering Processes
 - Using energy efficiently
 - Exploiting new lightweight Materials, Downsizing and Weight Reduction
 - Delivering accelerated Development

It is expert

- in the efficient use of energy (gasoline up to now)..... and in being
- the Perfect Consumer Marketing Platform for products and technology



Promotion and popularizing of winning technologies

- Motorsport is a platform to showcase energy efficient technologies
- Winning technologies always become “cool” and “in demand”
- Public audience accepts “green” cars are “cool”
- In turn, opens up substantial new sources for “green” sponsorship
- Motorsport becomes more acceptable to society and becomes a powerful “green” influencer



Barwell Aston Martin DBRS9s





Car manufacturers (OEMs) desire to develop technology to sell cars

- OEMs are the PRIME customers of motorsport
- Legislation and consumer demand drives OEMs to produce more efficient, lower emission vehicles
- Motorsport must service these customer desires by utilizing OEM R&D budgets
- Customers will demand cars and technologies which are proven “race winners” and use “energy” most efficiently
- OEMs will use popularity of motorsport to sell energy efficient and “green” vehicles



Many proposed solutions to address CO₂

- Vehicle Down-sizing
- Restricting Vehicle Use
- Improved Weight, Aerodynamics, Friction
- Alternative Fuels and Energy
- Improved Powertrain Efficiency

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- Each solution has merits and all help

However, improved powertrain efficiency will be main-stay of short / medium term fuel consumption and CO₂ reduction



The Motorsport Powertrain beyond five years

- Consistent with road cars pressure to reduce CO₂, so will motorsport reduce fuel consumption year on year
- Continuous, evolutionary reductions in the fuel energy limit
 - similar to that required for fleet average CO₂ for road cars in Europe, Japan & USA
- Exhaust heat recovery offers significant potential for improved energy efficiency - putting motorsport at the leading edge of technology in this vital area
- *Bottom line, however, is that the sport must remain exciting to stimulate spectator and sponsor interest*

Opel Eco Record Breaking

- Links High Performance with High Efficiency through their Eco-speedster250kph at 2.5l/100km





Ricardo's new performance regulation system - **PACER**

..... encourages energy efficiency on the race track

- Ricardo have developed a new system – “PACER” – Performance Alignment by Combustion Energy Regulation
- PACER accurately measures fuel flow to the engine, enabling regulatory bodies to enforce that a predefined energy flow limit is not exceeded
- The PACER system applies fairly and equally to all engine and fuel types. Tested on track for a full racing season in a BTCC vehicle

Ricardo



New approach to Engine Regulations

- Current methods of limiting engine power do not encourage fuel efficiency
 - air restrictors
 - rpm limits
 - specified engines
- New approach required
 - must reward fuel efficiency and low Carbon
 - be relevant and easily understood
 - simplify equivalency issues
 - encourage entries using alternative fuels

....but remain fast and exciting



New approach to Engine Regulations

- Limit fuel flow - not really so new!
- Need to control fuel flow across whole rpm range and think in terms of fuel energy
- More open fuel flow regulations must be introduced stepwise
- Select fuel flows to match current power outputs
- Eventually “energy flow” might be the only power plant regulation
- Fuels must remain relevant



Conclusions

- F1, representing the technological pinnacle of the sport, can lead promotion of these new initiatives
 - Current discussions with F1 manufacturers/teams will radically change the nature of the F1 engine powertrain, whilst keeping the sport exciting, competitive and spectacular
 - By becoming increasingly “road relevant”, there will be potential for significant budget savings – e.g. through common R&D
 - Many series are already taking up energy efficient concepts
- ...there is now a real opportunity for motorsport to lead road car technologies in many key areas, notably energy recovery systems*

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D1 Oils Bio-diesel Lola





New Business Opportunities already created.....

- D1 Oils (with BP) using oil from jatropha, a crop grown in poor soil areas, uses Motorsport to promote this concept
- Minister Engines using E85 fuel in Caterham Formula Woman race series
- ALMS embraces diesel, ethanol, E10, soon E 50 and even hybrids
- IRL now ethanol powered – linked to EPIC funds
- Vectrix electric motorcycles in use as paddock bikes in A1 GP
- Bio-ethanol powered Aston Martin from Barwell Motorsport wins GT race
- SEAT diesel wins WTCC race
- Xtrac link to Torotrak for KERS in F1 and sports cars

.....and many more for you to exploit in the future.....



QUESTIONS?



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