

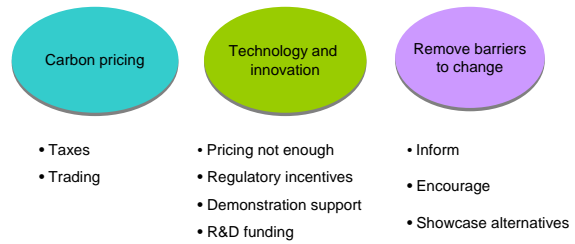
Low Carbon Transport: Policy Aspiration or Profit Opportunity?

Automotive World Conference

Adam Chase
Director

30th October, 2007

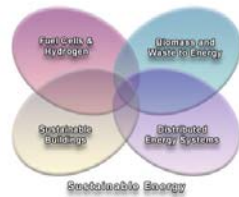
Stern Review approach: three-legged framework



Source: Department for Transport

E4tech's perspective

- Consultancy, established 1997
- **Based:** UK and Switzerland
- **Services:** strategy, business support, technology review and policy input
- **Clients** include: industrial companies, government, technology startups, investors
- This presentation in partnership with

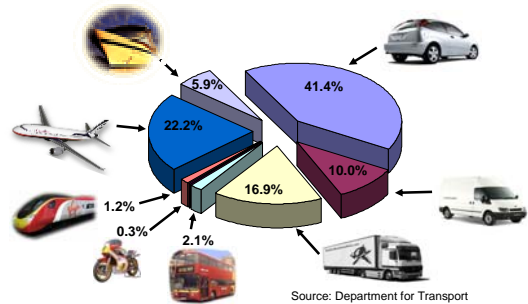


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Road vehicles are seen as a key area for policymakers

UK Transport CO2 Emissions by Mode



Source: Department for Transport
Includes UK and international emissions 2005

This morning...

Regulatory background

Profit opportunity?

Conclusions

- Concentrate on CO2... plenty of other regulatory challenges too
- Do not intend to discuss whether low carbon transport is needed
- Try to take the long view

2007 Energy White Paper and Low Carbon Transport Innovation Strategy

Themes

- Technology will have a significant role to play in reducing transport CO2
- Case for strengthening Government interventions across the "innovation chain"
- Adopt the Stern approach
- Recognition of uncertainty - importance of options
- Links between lower carbon transport and lower carbon energy generation

Road transport specifics

- Support for demanding and mandatory EU wide new car CO2 targets
- Graduated VED extended in Budget
- Communications campaign on vehicle purchasing and eco-driving
- New Automotive Innovation Platform (with funding from the Technology Strategy Board, DfT and EPSRC)
- Low carbon transport theme to Energy Technologies Institute with additional (£5m pa) DfT contribution
- New Government procurement targets and a new (initial £20m) fund to support procurement of fleet demonstrations of lower carbon vehicles
- Stern/King Review further considering the scope for decarbonisation of road transport over time

Stern / King Review of low carbon cars: phase 1 findings

- Stern's original UK road transport targets of 30% CO2 reduction (50% per km) 2000-2030 are achievable but require urgent action
- No single solution

Energy carriers

- All fuels should be considered on a well to wheels basis
- Biofuels are part of the solution, in moderation
- Vehicle electrification by batteries or fuel cells will be needed. The linkage to power generation will become important

Energy conversion

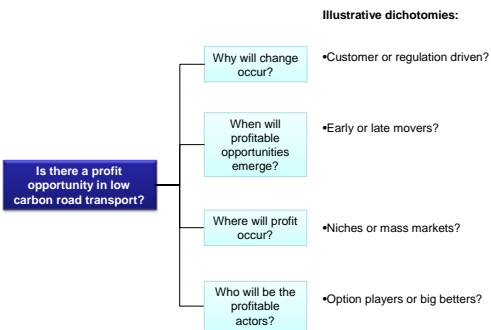
- ICE improvements could deliver 30% CO2 reduction per vehicle within 10 years

Energy use

- Consumer choices, driver behaviour and modal shift offer potential savings of 10-15% in the near term

.....Recommendations will follow in March 2008

Breaking down the question

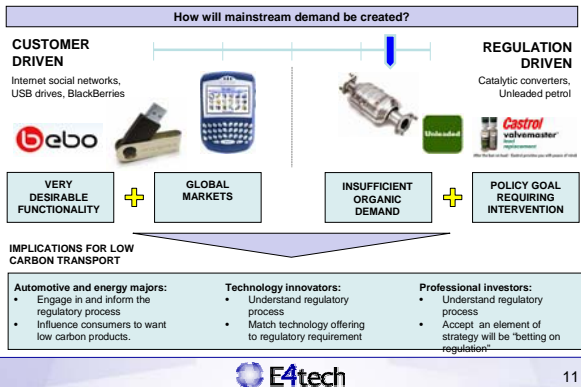


Regulatory background

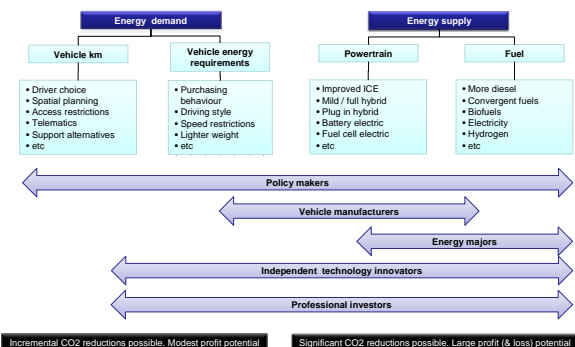
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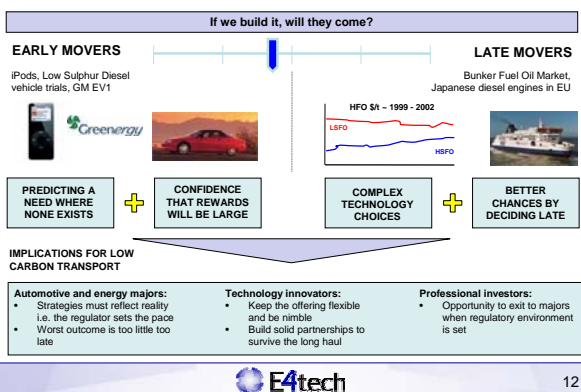
Why: Customer or regulation driven?



Decarbonisation involves numerous options and players



When: Early or late movers?



Where: Niches or mass markets?

Will profitability occur in niches or the mass market?

NICHES		MASS MARKETS	
Laptop PCs, Vehicle Air Conditioning, Satnav	Low energy lightbulbs, Jubilee Line Extension, Hybrid cars		
DEFENSIBLE MICRO MARKETS	MOVE DOWN COST CURVE OVER TIME	FEW MICRO MARKETS ACCESSIBLE	WILLINGNESS TO ABSORB EARLY COSTS

IMPLICATIONS FOR LOW CARBON TRANSPORT

Automotive and energy majors:	Technology innovators:	Professional investors:
<ul style="list-style-type: none"> Markets may not absorb costs from day one This becomes possible if the playing field is level 	<ul style="list-style-type: none"> Be prepared to come down the cost curve quickly – the market for high cost is small Majors are the main route to market – profit-on-exit 	<ul style="list-style-type: none"> Look for ability to reduce cost Does exit route exist?

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There is a profit opportunity, reliant upon timely option building that is aligned with regulation and mass market opportunities

Is there a profit opportunity in low carbon road transport?

- Why will change occur?**
 - Regulation is key. Influencing the regulator is helpful, but don't expect supernormal profits for long, if at all.
 - Aim to influence customers to want low carbon as this helps you and the regulator.
 - Independent innovators and investors are betting on regulation
- When will profitable opportunities emerge?**
 - Largely up to the regulator. For corporates it is easier to recover from too much too soon than too little too late, since regulation effectively removes your licence to operate if you are not prepared
 - Innovators and investors can profit by exits to majors when mass market direction becomes clear
- Where will profit occur?**
 - Mostly in mass markets for major players – few consumer-led niches
 - Innovators must be ready to come down the cost curve fast, investors will seek this
- Who will be the profitable actors?**
 - Majors need to place lots of options, not big bets, while the future is still uncertain...then act fast
 - Independent innovators and investors make bigger bets, but careful hedging with other markets can help

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Who: Option players or big betters?

Is it better to have a small activity in lots of technologies or a big activity in a few?

OPTION PLAYER		BIG BETTER	
Pharmaceuticals, early internet portals	ChemConnect	Iridium satellite phone network, Airline reservation systems	Sales Hedges
NO CLEAR TECHNOLOGY WINNER	ABLE TO MOVE FAST ON SUCCESS/FAIL	TECHNOLOGY NARROWED DOWN	EXISTING MARKET ADVANTAGE

IMPLICATIONS FOR LOW CARBON TRANSPORT

Automotive and energy majors:	Technology innovators:	Professional investors:
<ul style="list-style-type: none"> Develop lots of options for longer term market challenges Prepare to act quickly when options are narrowed down 	<ul style="list-style-type: none"> Biggest bets usually offer biggest rewards so pick carefully! Mitigate market risk by finding alternative applications as well 	<ul style="list-style-type: none"> Balanced portfolio is important Non transport markets could mitigate risk

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Regulatory background

Profit opportunity?

Conclusions

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