

Challenges and opportunities to decarbonise fuels

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Arval Fuels Forum

7th April 2011

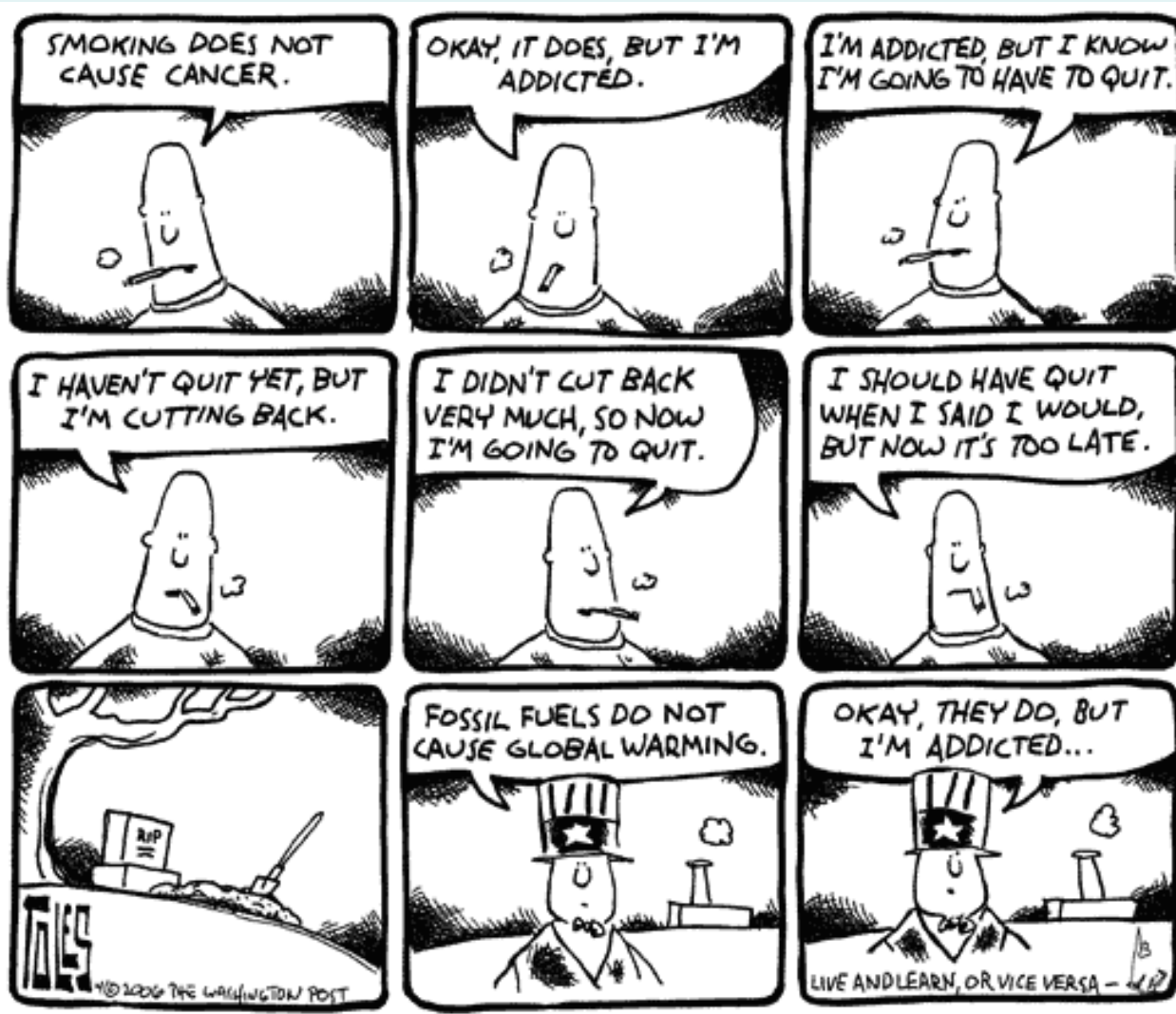
LowCVP 's mission is to accelerate a sustainable shift to low carbon vehicles and fuels & stimulate opportunities for UK businesses

LowCVP delivers its mission by:

- ❑ Working with Government (and other policy makers) to enable the development and deployment of more effective market transformation policies and programmes
- ❑ Engaging industry, stimulating and leading voluntary industry-wide initiatives
- ❑ Ensures consumers are informed about the opportunities and benefits of lower carbon options promoting their uptake
- ❑ Helping UK business, especially SMEs, to benefit from the new market opportunities
- ❑ Encouraging action and building a consensus for sustainable change through enhancing stakeholder knowledge and understanding.

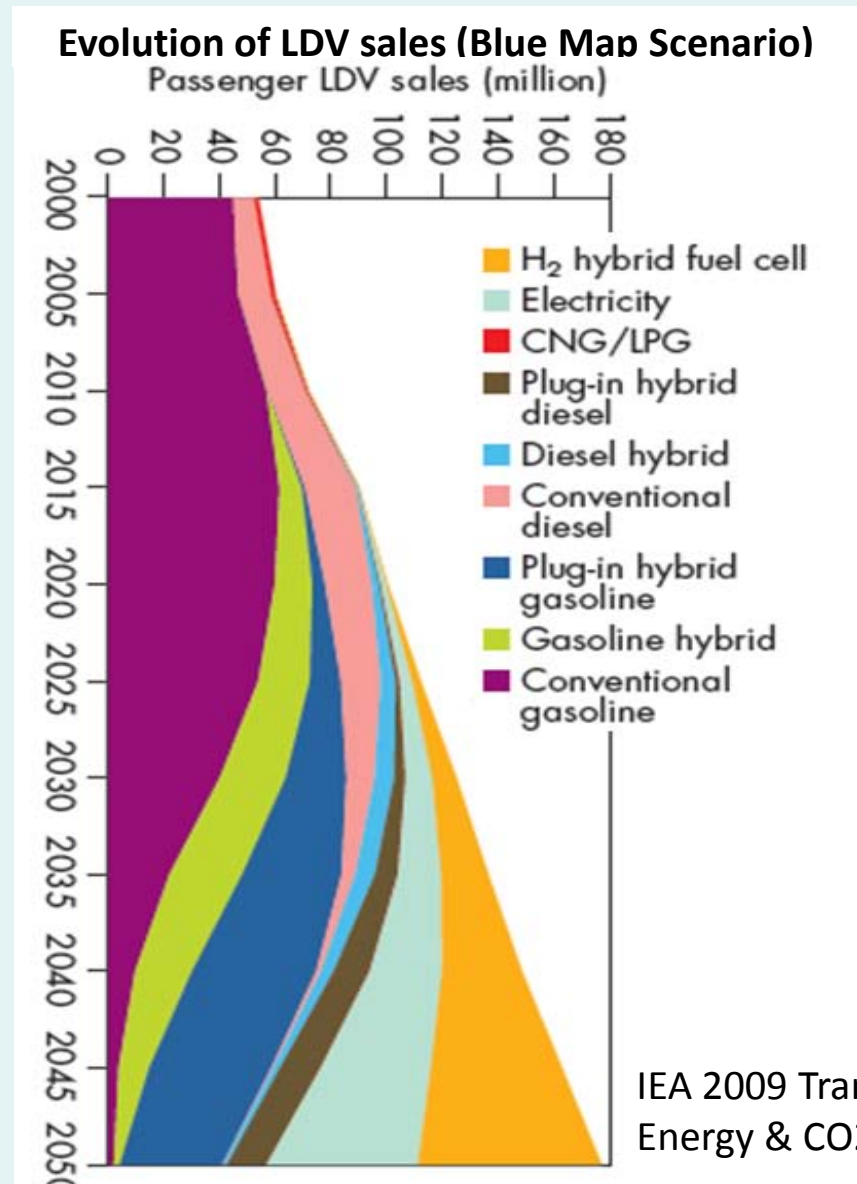
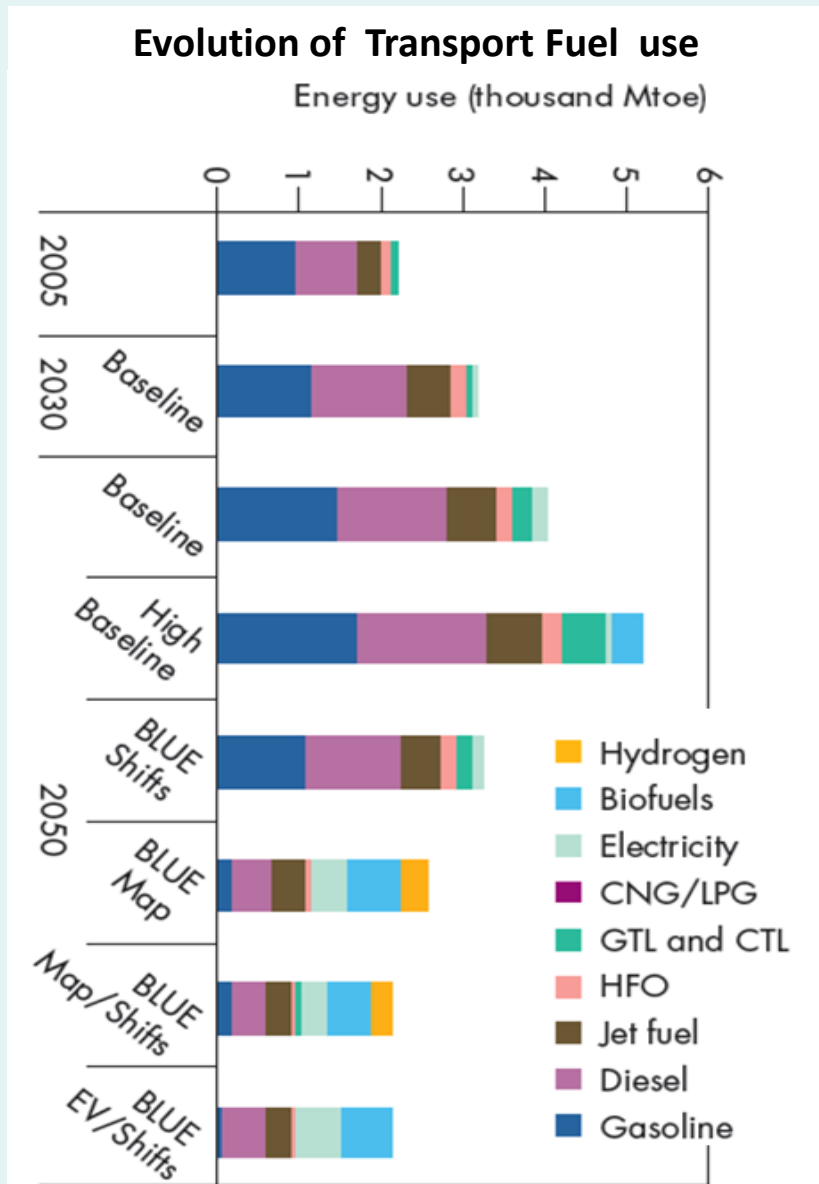


Outline



- ❑ The future fuel mix
- ❑ Current alternative fuel challenges
- ❑ Types of biofuels
- ❑ Sustainability concerns and sourcing responsibly
- ❑ Biofuels blends and vehicle warranties
- ❑ Biomethane
- ❑ Hydrogen
- ❑ Key messages

Transport fuels and vehicles will become increasingly diverse – there are no silver bullets



IEA 2009 Transport, Energy & CO₂

To 2020 the challenge is to ready the market for renewable fuels – but which option?

	1 st G Bio	2 nd G Bio	H2-IC	H2-FCV	Bio-CH4	EV
Technology readiness						
Cost competitiveness						
Vehicle availability						
Infrastructure deployment						
Driver acceptability						
Sustainability						

Why biofuels?

- ❑ Address multiple policy challenges: climate, security of supply and rural development
 - 10-20% transport energy globally by 2030
- ❑ Energy dense, liquid fuels
 - biodiesel > bioethanol > biogas
 - Utilise existing infrastructure
- ❑ Multiple feedstocks and production processes
 - 5 feedstock and two processes currently dominate
- ❑ Cost-effective – at current fuel prices
- ❑ Strong global regulatory support
 - Not in the UK
- ❑ Technology improving: 2nd and 3rd generation fuels in development



There is considerable (but unnecessary) confusion regarding vehicle warranties for different biofuel blends

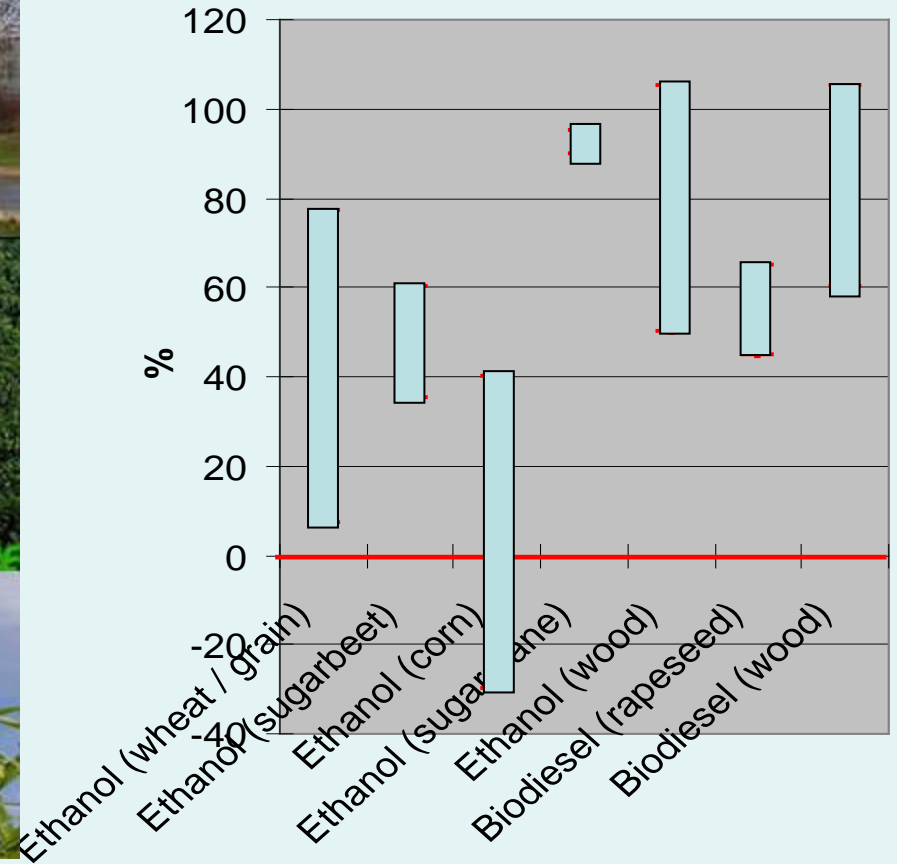
- ❑ EN590 now permits 7%v/v biodiesel
 - Biodiesel should comply with EN14214
 - Many manufacturers warrant B30 blends with fleets
 - Adapted vehicles pre-2004 models can generally run on high blends of biodiesel
 - There is a small fuel economy disbenefit (1-3%)
- ❑ EN228 now permits 5%v/v bioethanol
 - >90% of vehicles can use B10 blends
 - Ethanol only has 70% the energy content of petrol
- ❑ There is generally poor communication about the acceptability of biofuel blends
 - Germany 2011
- ❑ There are no longer any UK filling stations selling E85 and very few supplying B30



There are good and bad ways of producing biofuels that assurance schemes can distinguish between

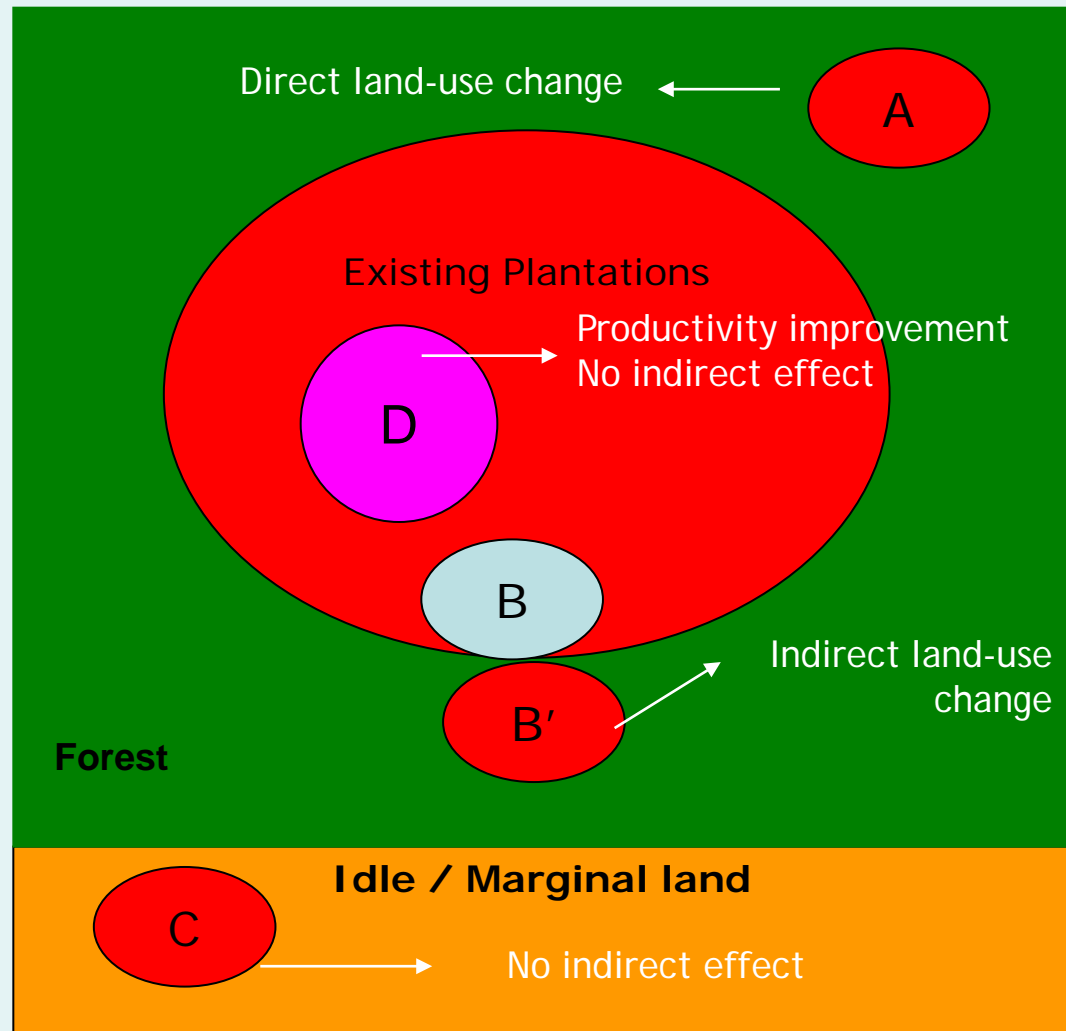


% WTW GHG savings compared to petrol or diesel



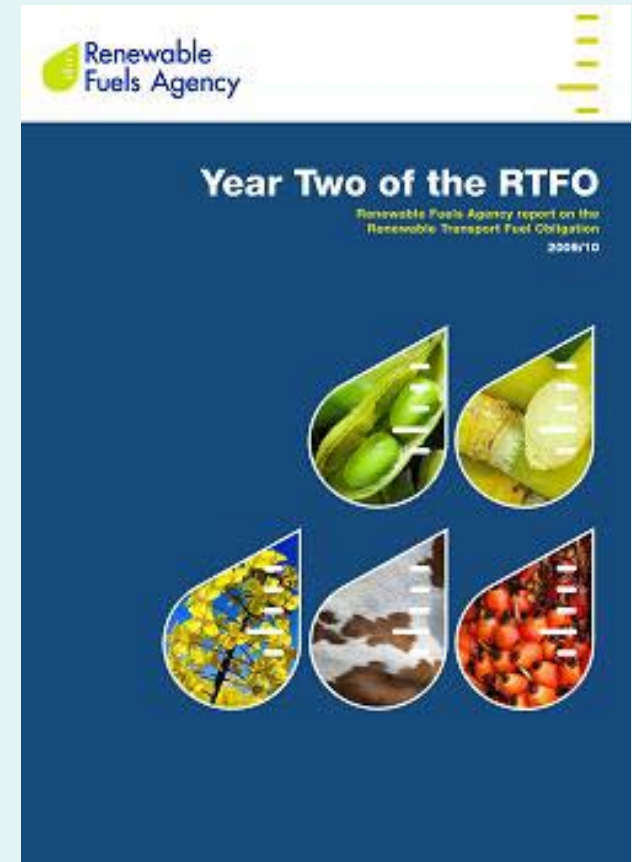
Derived from Concawe 2006

Indirect effects on land use and food prices have emerged as a key concern and future legislative driver



Sourcing of good quality, sustainable biofuels and maintaining tanks is essential to avoid breakdowns, deliver environmental benefits and protect corporate image

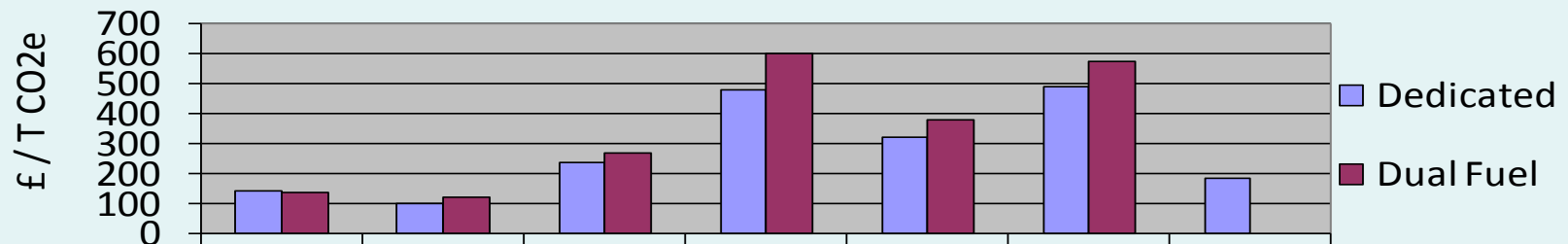
- ❑ Ensure fuel is of a good quality EN41214 and from a reputable supplier
- ❑ Buy from a supplier that can guarantee the feedstock origin
 - Used cooking oil and tallow are the most sustainable biodiesels
 - UK bioethanol is highly sustainable
- ❑ Compare suppliers reports compiled by the Renewable Fuels Agency
 - Greenergy ranked top of principal suppliers
- ❑ Tank cleaning and avoiding water ingress are essential to avoid contamination



Trucks, buses and refuse trucks are the most promising sectors for using biomethane in transport – 20%+ market penetration is achievable

- ❑ Mature technology – 12M natural gas vehicles worldwide, 10%pa growth
- ❑ Limited other low carbon options – none that can provide ultra-low carbon vehicles
- ❑ High emission and mileage vehicles – maximises benefit of low carbon fuels
- ❑ Large fleets with low ownership fragmentation
- ❑ Bunkered fuel at depots – manageable refuelling infrastructure
- ❑ Cost-competitive with diesel – with duty and bus incentives – in large fleets
- ❑ “Blend wall” prevents 10% Renewable Energy Directive target for transport energy being met

Biomethane cost effectiveness



There are a number of key market barriers in the UK the forthcoming biomethane strategy must address

- ❑ High capital cost and limited range of vehicles
 - Incentivise early market
- ❑ Poor vehicle residual (resale) values
 - Establish 2nd hand market
- ❑ Absence of public refuelling infrastructure
 - Subsidise or incentivise
- ❑ Industry conservatism and poor past experience
 - Demonstrate new technologies
- ❑ Uncertain future duty regime –
 - Extend 3 year foresight
- ❑ High costs and poor returns for biogas gas suppliers compared to other sectors
 - Balance incentives between sectors
- ❑ Absence of political leadership
 - Biomethane in transport strategy
- ❑ Relatively high distribution costs
 - Green gas certificate scheme



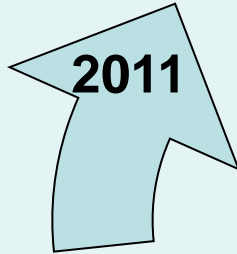
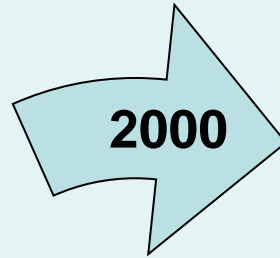
Hydrogen fuel cell vehicles offer significant but still distant prospects

Key challenges:

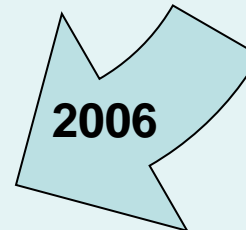
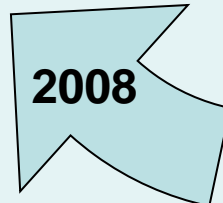
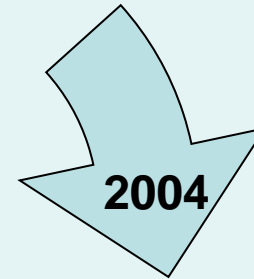
- ❑ Higher costs per unit of energy
 - Adequate price of carbon mitigation
- ❑ Supply of renewable hydrogen
- ❑ Development of refuelling infrastructure and practical storage
 - Chicken and egg supply problem
- ❑ Supply of a range of affordable vehicles
 - Fuel cell costs, durability and reliability
- ❑ Improving public acceptability
- ❑ Alternative LC-options
- ❑ RD&D funding



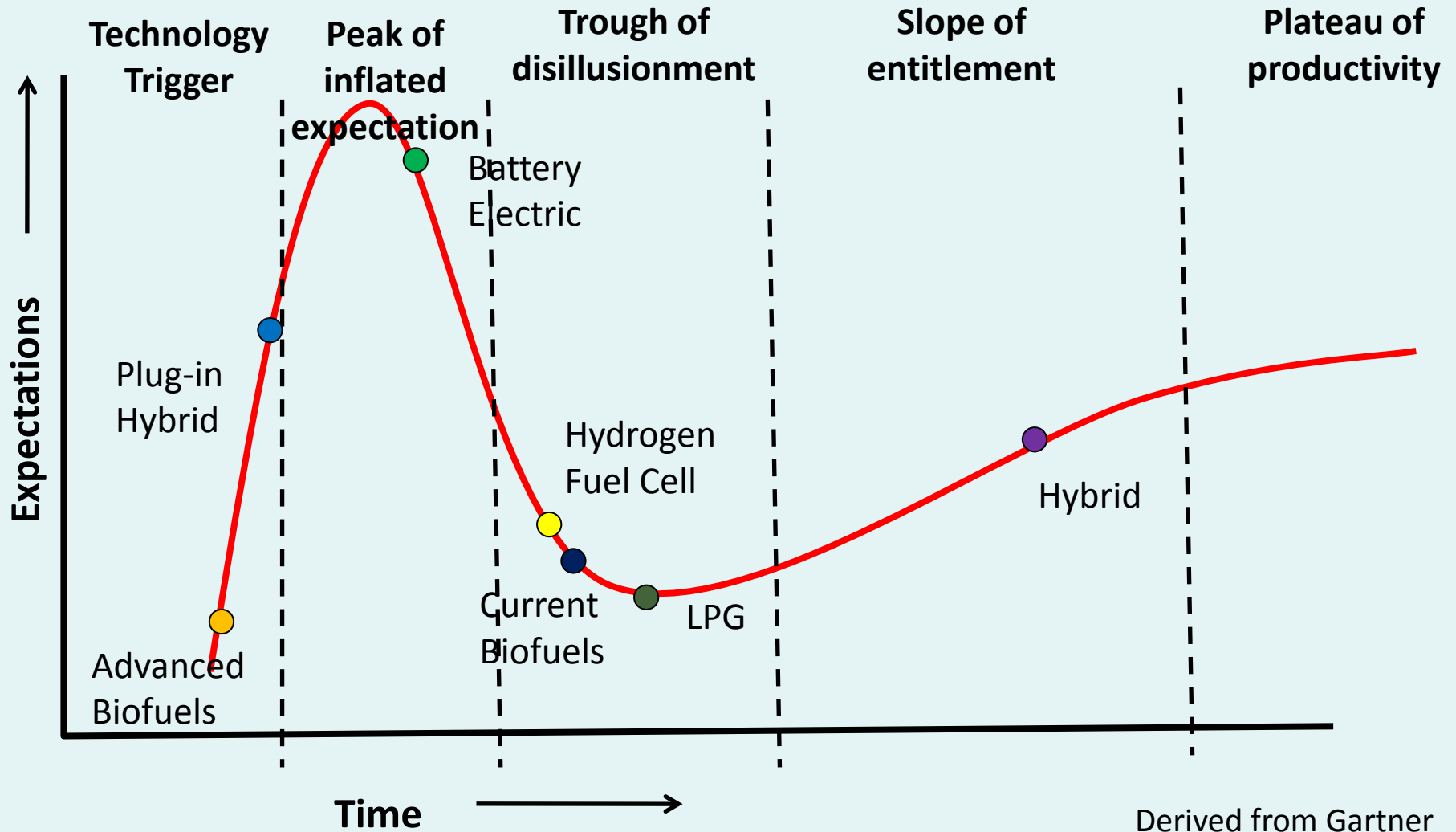
Recent history shows there are no “silver bullets”



Recent fashions in low carbon vehicle technologies



The adoption of new technologies is likely to be incremental and does not follow the hype cycle



Final Thoughts

- ❑ We must wean ourselves off our petroleum dependency
- ❑ There are no silver bullets – just over hyped solutions
- ❑ Selecting lower carbon options models, travel management and driver training can deliver significant cost and carbon savings now!
- ❑ Beyond 2020 renewable fuels will play an increasing important role; before 2020 we need to ready the market
- ❑ Many vehicles can operate on high blend biofuels in managed fleet operations – but good storage is essential
- ❑ There are genuine sustainability concerns with some but not all biofuels – source responsibly
- ❑ Biomethane offers real potential in trucks and some van fleets – but payback times are presently too long for mass market appeal
- ❑ Hydrogen will provide a long-term solution – but costs will remain prohibitive for a decade or more.



Any Questions?

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The Low Carbon Vehicle
Partnership

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www.lowcvp.org.uk



Join the LowCVP

LowCVP members are: influential; networked; informed; engaged; committed; leaders; knowledgeable. **ARE YOU?**

www.lowcvp.org.uk

How to get involved?

Reason for membership

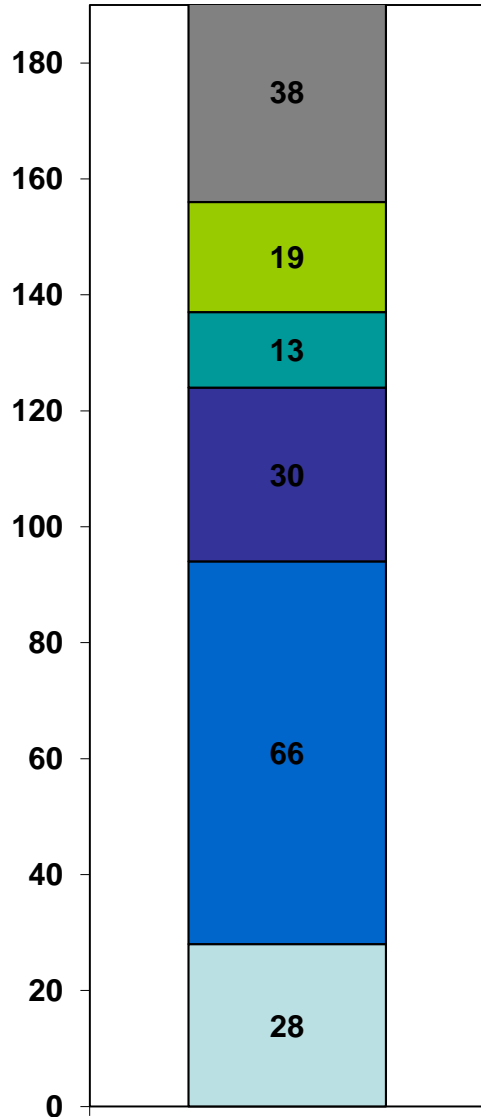
- Demonstrating leadership
- Keeping abreast of issues
- Building consensus
- Increasing influence
- The work programme
- Networking
- For information
- Financial and marketing

Membership requirements

- Actively support the shift to low carbon vehicles and fuels
- Endorse the membership principles and commitments
- Make a membership contribution
- Complete the membership form
 - <http://www.lowcvp.org.uk/about-lowcvp/how-to-join.asp>
- Join a working group

Category	Turnover	Annual fee
Large company	>£50M)	£2750
Medium	>£1.5M <£50M	£550
Small	<£1.5M	£138
Public sector & academic		£138
Not for profit		£55

185 members and growing?

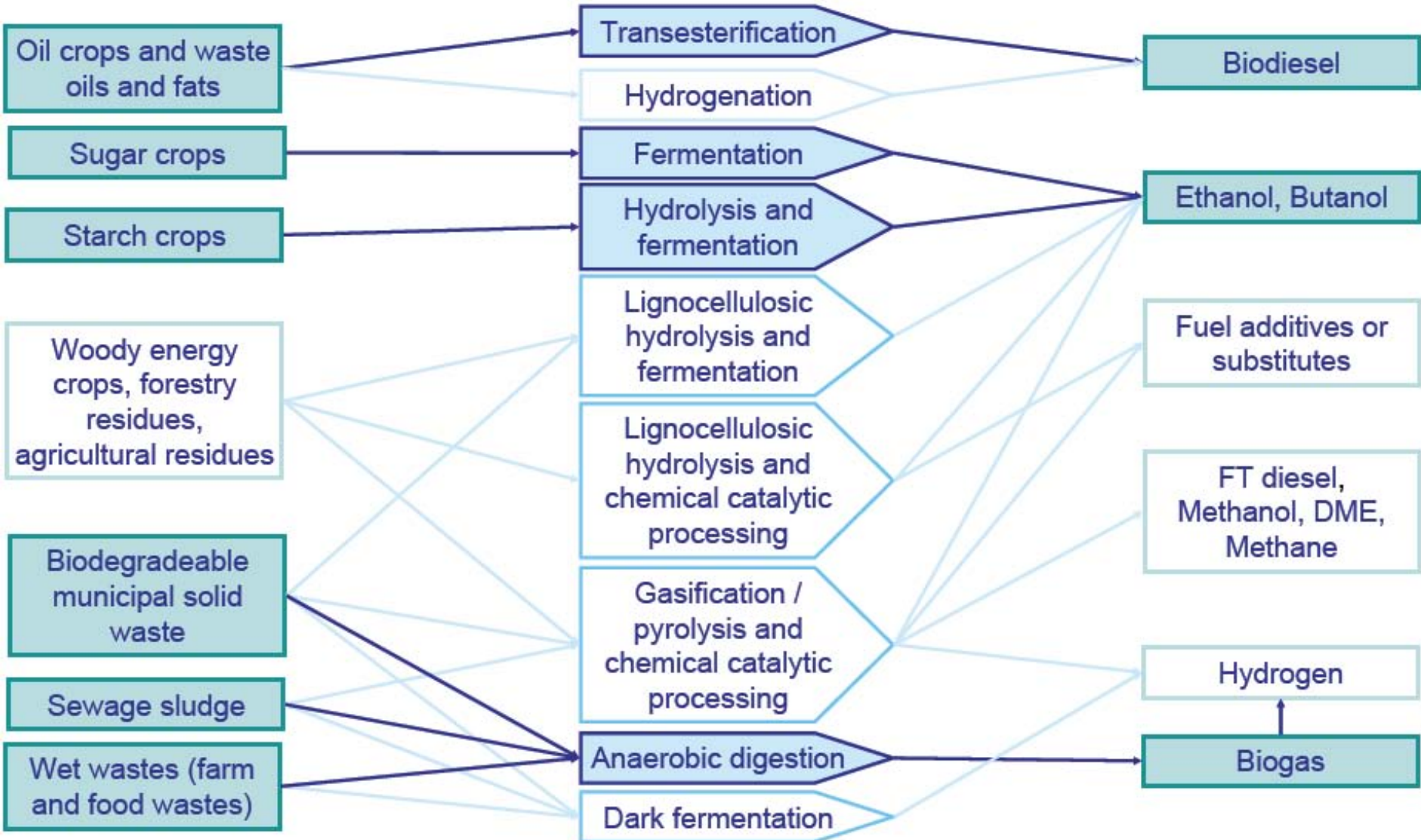


- Research & env
- Gov & Public
- Operator & consumer
- Energy
- Auto supplier
- Auto manufacturer



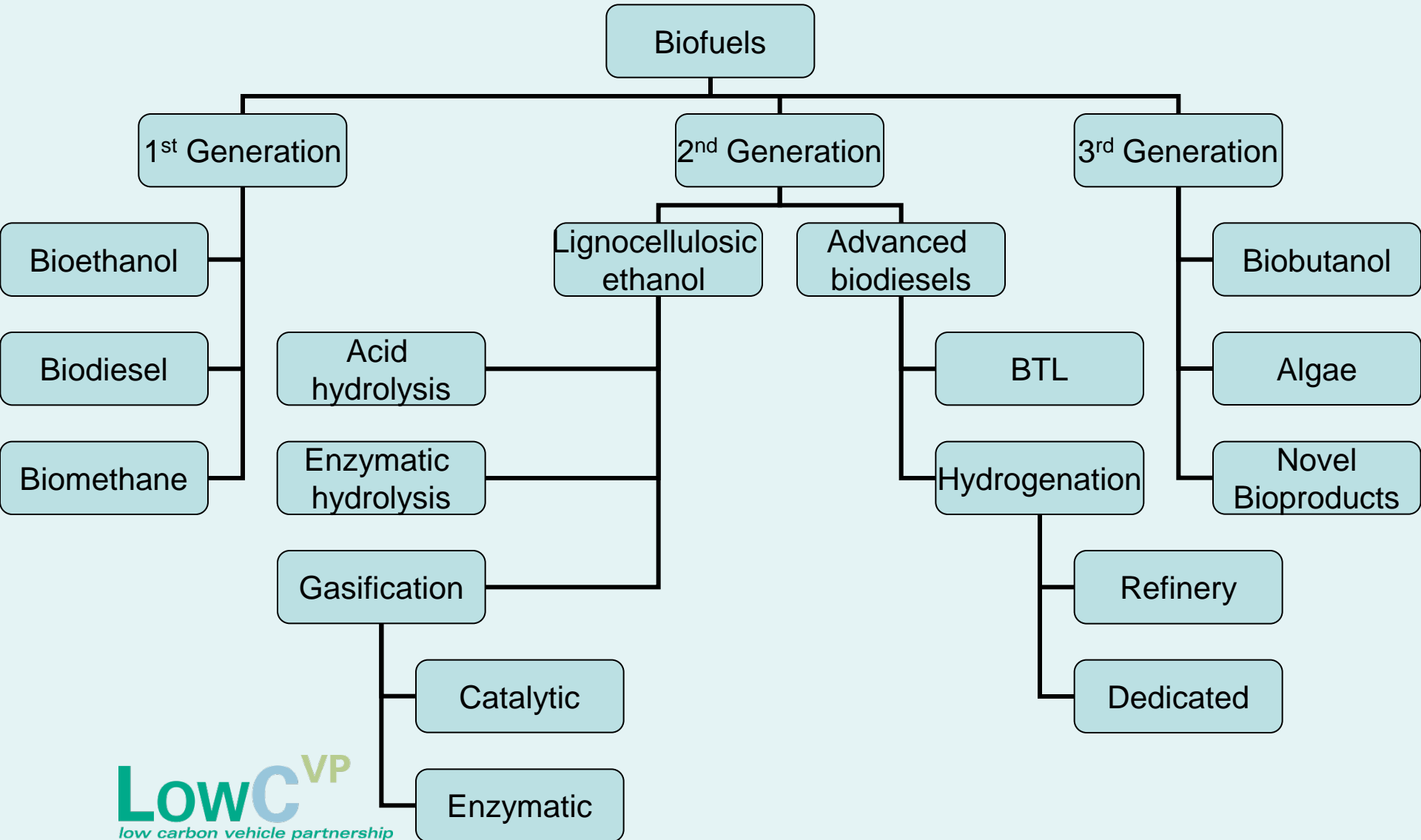
There are multiple feedstocks and pathways through which to produce biofuels

E4tech 2007



Commercially available, or 1st generation, routes are shaded blue, next generation routes are unshaded

Biofuel taxonomy is confusing



Multiple feedstocks enable a globally diverse market – but 5 crops dominate



Source: Global Biofuel Center, 2008