



Introducing BP Biofuels

a growing alternative

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7th March 2007

Drivers for Change

Key drivers in moving towards sustainable mobility solutions

- Security of supply & energy diversification
- Climate change issues

Biofuels address both these issues.



Security of Supply and Energy Diversification



- Geological evidence proves we are not running out of crude oil
- Biofuels will help governments achieve their energy security goals and reduce dependence on imported oil
- Biofuels have the added benefit of helping the agriculture sector

Imported Energy Dependency Profile

| Transport | 2004 | 2020 |
|-----------|------|------|
| N America | 53% | 64% |
| EU | 81% | 89% |
| China | 47% | 72% |
| India | 66% | 84% |

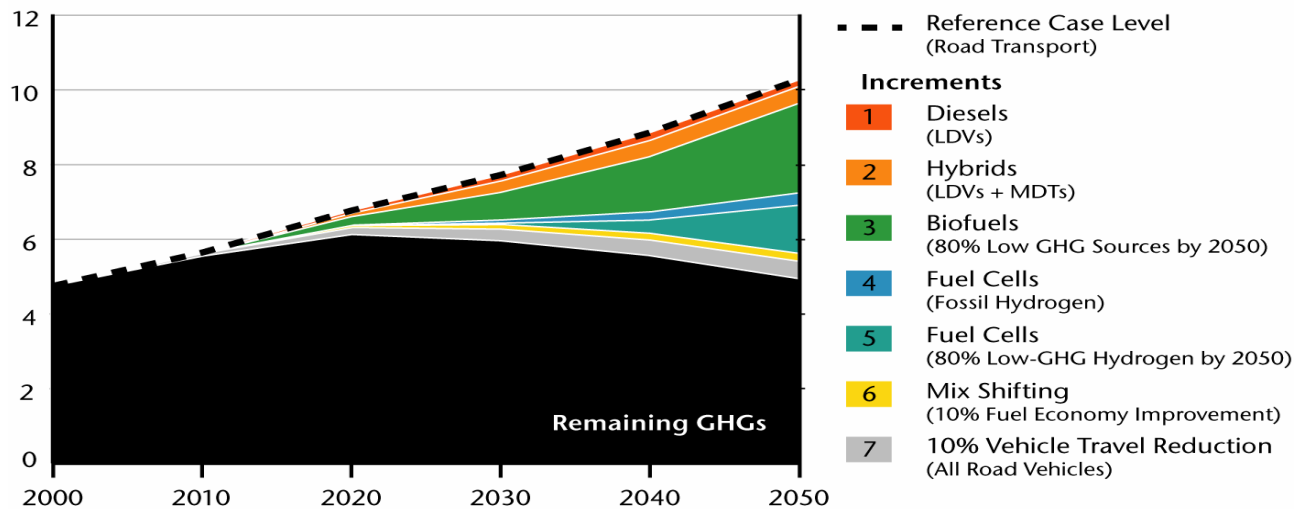


Greenhouse Gas Emissions Reduction

- Transport energy demand is projected to double by 2050
- Transport comprises 21% of CO2 emissions
- A variety of technologies can reduce GHG emissions in the future
 - Vehicle efficiency
 - Biofuels and other renewable fuels
 - Demand reduction

Combined Technology Case

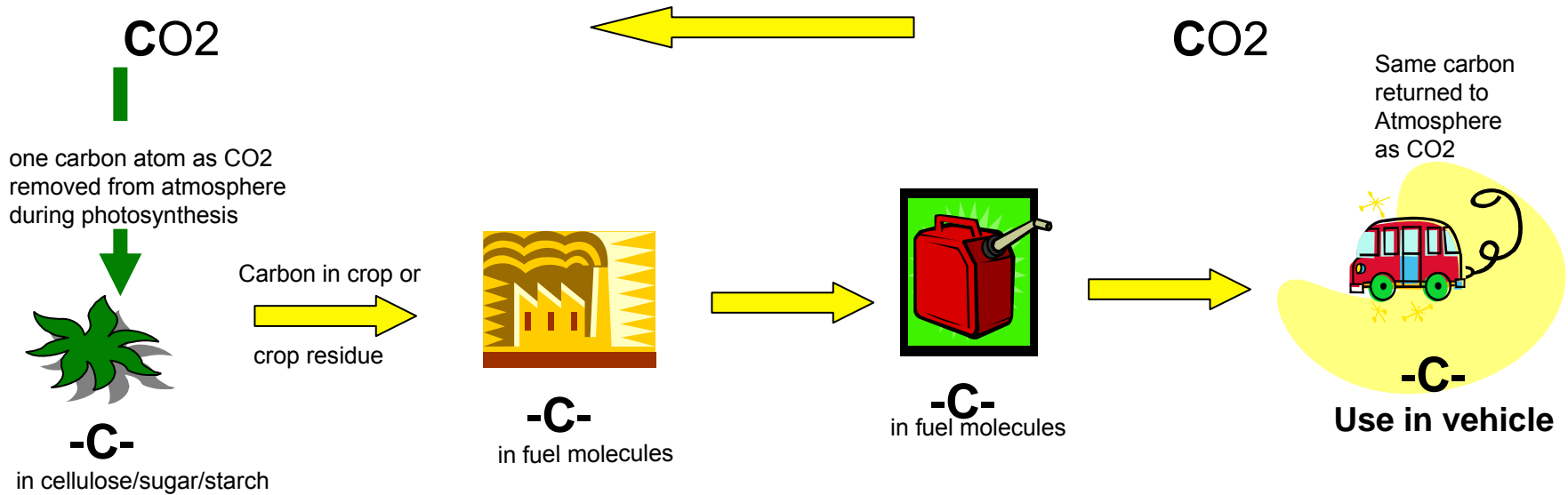
Gigatonnes CO₂-Equivalent GHGs



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Biofuels Overview - the carbon cycle



Fossil Energy Inputs

Biomass growth



External energy and associated GHG emissions for farming (eg from fertiliser use)

+

Processing to produce biofuel



External energy and emissions for fuel production process

+

Biofuel



External energy for distribution & transportation

=

WTW GHG emission result for biomass pathways. Contribution from above closed cycle is zero

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Environmental and Social considerations

Standards being developed through Low Carbon vehicle partnership

- GHG Certification
 - Not all biofuels equal on GHG basis
 - LowCvp study showed ethanol can vary between 7 – 87% GHG savings
 - Methodology to quantify supply chains been developed
- Environmental Sustainability
 - 5 principles with 25 criteria as well as enhanced criteria
 - LEAF an example of environmental sustainability standard
- Social and Ethical
 - ILO worker standards
 - Moving indigenous populations
 - Child labour



Low Carbon Vehicle Partnership



Accelerating a sustainable shift to low carbon vehicles and fuels in the UK

Stimulating opportunities for UK businesses



Why are carbon certification and sustainability assurance important?



- **Carbon certification**
 - Systematic method of measuring the GHG savings (carbon intensity) of biofuels
- **Sustainability assurance**
 - Ensuring biofuel production does not cause other forms of environmental degradation or social inequity
- Needed to:
 - Minimise unintended, negative consequences of biofuels market development
 - Consistently quantify greenhouse gas savings on a well-to-tank basis
 - Drives energy efficiency in biofuel supply chain
 - Potential to incentivise low carbon intensity fuels

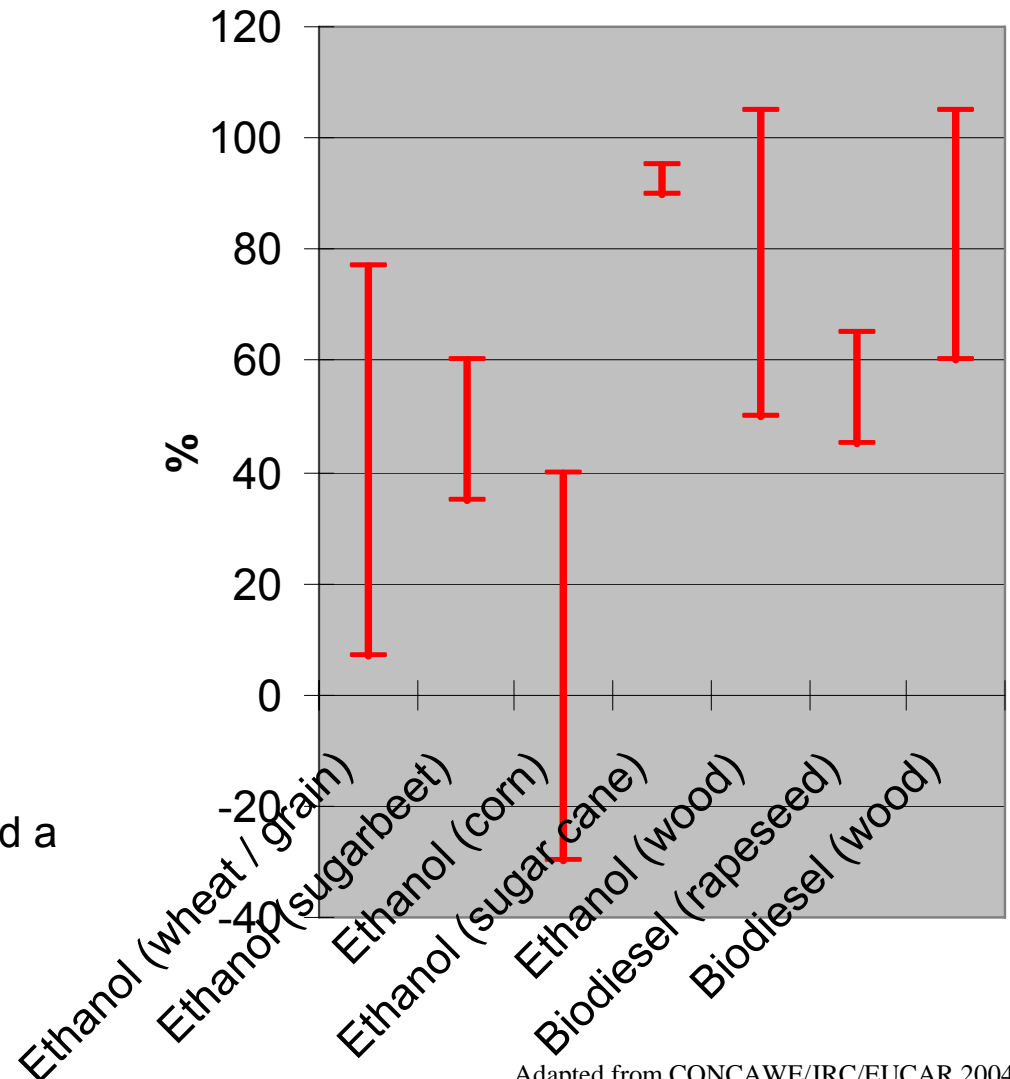


Well to Wheel GHG savings vary widely



% WTW GHG savings compared to petrol or diesel

- GHG savings (& production costs) of biofuels vary widely depending upon:
 - Feedstock
 - Cultivation processes
 - Production processes
 - By-product use
- Certification of GHG savings requires development of a methodology appropriate for all fuels
 - LowCVP members have reached consensus on the boundaries and methodology for C-balance calculations
 - Further work has developed & tested a framework for C-certification

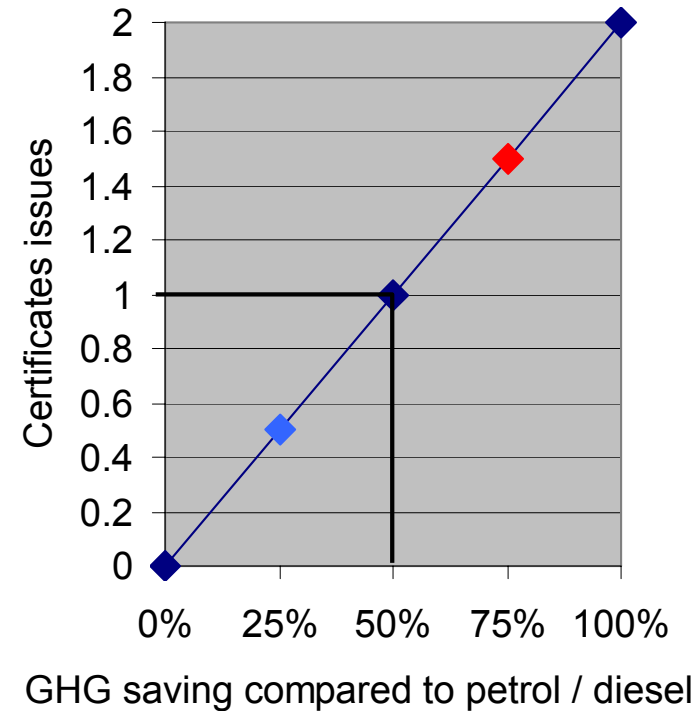


Carbon certification and sustainability assurance included within the RTFO



- Initial reporting requirement will assess the scale of sustainability issues and quantify GHG saving
 - Reporting will encourage corporate social & environmental responsibility from fuel suppliers
- Future incentive scheme could link award of RTFO certificates to the C-intensity of the biofuel
- Reporting of GHG saving is appropriate for *testing* new systems, but without incentives:
 - The market will source predominately low cost fuels - with a low GHG balance
 - £ / t C saved will be higher
 - Higher GHG saving processes are not encouraged
 - No incentives for new (including 2nd Generation) technology

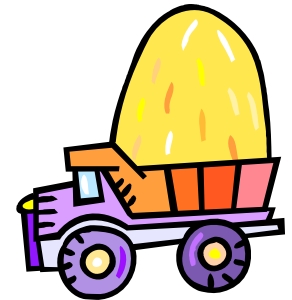
Incentive scheme would link award of certificates to GHG saving



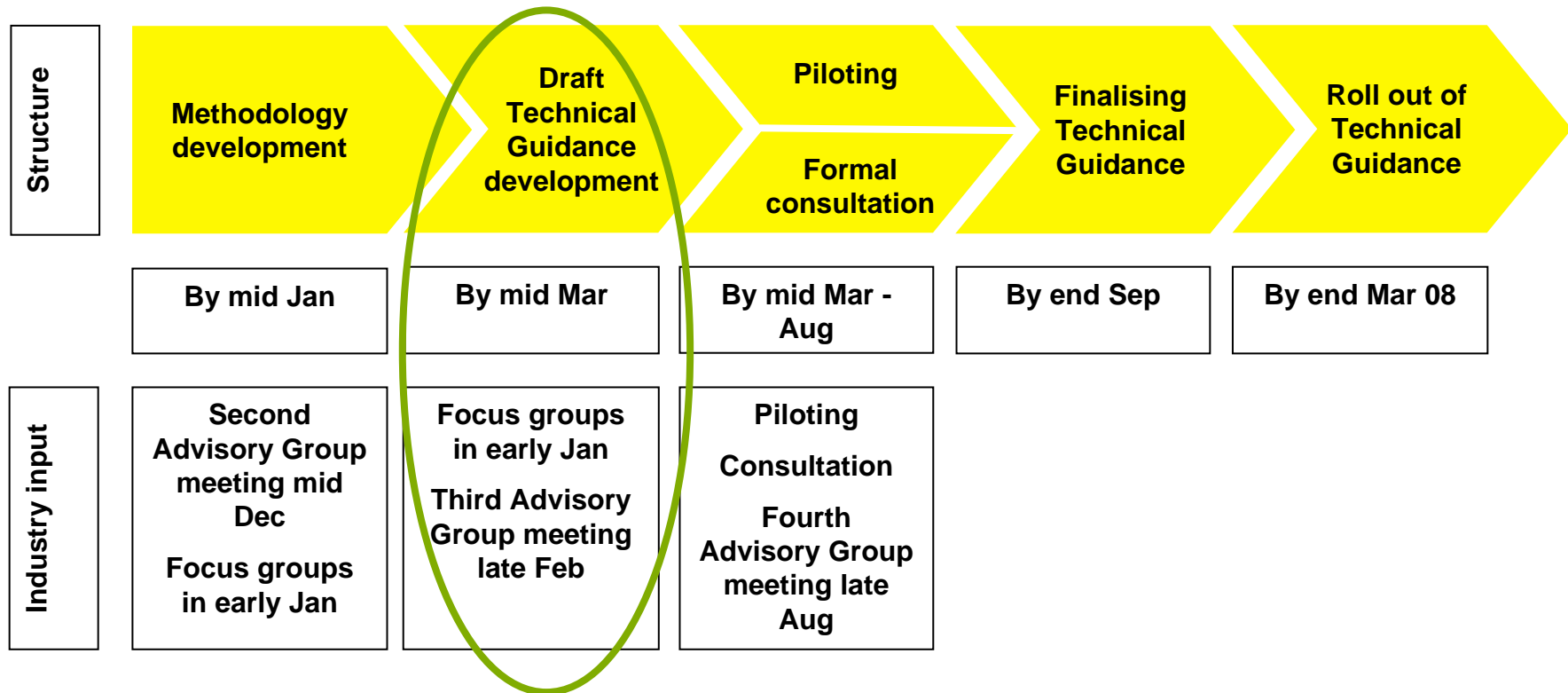
◆ 1 certificate for 1l fuel with 50% GHG saving

Carbon certification system requirements initially used for reporting purposes

- Field-to-forecourt (well-to-tank) calculation
- Quantifies emissions at each stage of the production pathway but only for those used in UK mkt
- Consistent for different biofuel pathways
- Transparent
- Applicable to indigenous supplies and imported fuels
- Flexible & manageable data requirements. Capacity to:
 - Calculate GHG emissions based at each step in the pathway using real data for individual, or multiple batches; or
 - Use default values to estimate emissions at each step & cumulatively
- Auditable



Approach



Summary



- Carbon certification & sustainability assurance are essential elements of biofuels market development to:
 - Minimise unintended, negative consequences of biofuels
 - Quantify & incentivise greenhouse gas savings
 - Encourage GHG efficiency in supply chain
 - Avoid lock-in to low cost/efficient technologies
- Transparent, flexible, practical methods for quantifying biofuel carbon intensity are being developed
- Trade rules may preclude excluding fuels produced unsustainably (but do allow reporting)
- UK will include reporting requirements for GHG saving and sustainability within its RTFO
- Intention to develop incentives for low carbon intensity fuels in phase 2

Biofuels



Climate change and energy diversification will continue to underpin increased use of biofuels

If Biofuels are to make a significant impact on the two key drivers, we will need:

better Feedstocks

better Processes

better Fuel Molecules

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THANK YOU

