



# EESI Low Carbon Fuel Standard Discussion

June 5, 2007, Washington DC

# Why BP Would Support a Well-Designed LCFS



- We recognize the transport sector is especially challenging in addressing GHG emissions
  - Globally
  - California
- We agree that specific policies to address the transport sector are needed in parallel with economy-wide approaches
- We are conceptually aligned with California's emerging approach on addressing transport GHG emissions, i.e. vehicle/fuel/consumer
- A LCFS is inherently a technology neutral approach
- BP sees a potentially large role for biofuels in a lower carbon future

# How BP is Preparing

For a low carbon transport future that includes biofuels

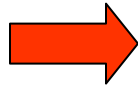


- Largest US marketer of ethanol
- Formed a new Biofuels business
- Investing \$500 M in new Energy Biosciences Institute at UC Berkeley to provide a pipeline of biofuels technologies
- Partnering with DuPont to develop advanced biofuels
- Introduced first new product with Dupont –biobutanol
- Actively involved in policy discussions on low carbon fuels



# “Conventional” bio-components

A positive first step, but...



Ethanol for  
gasoline



Biodiesel  
(FAME)

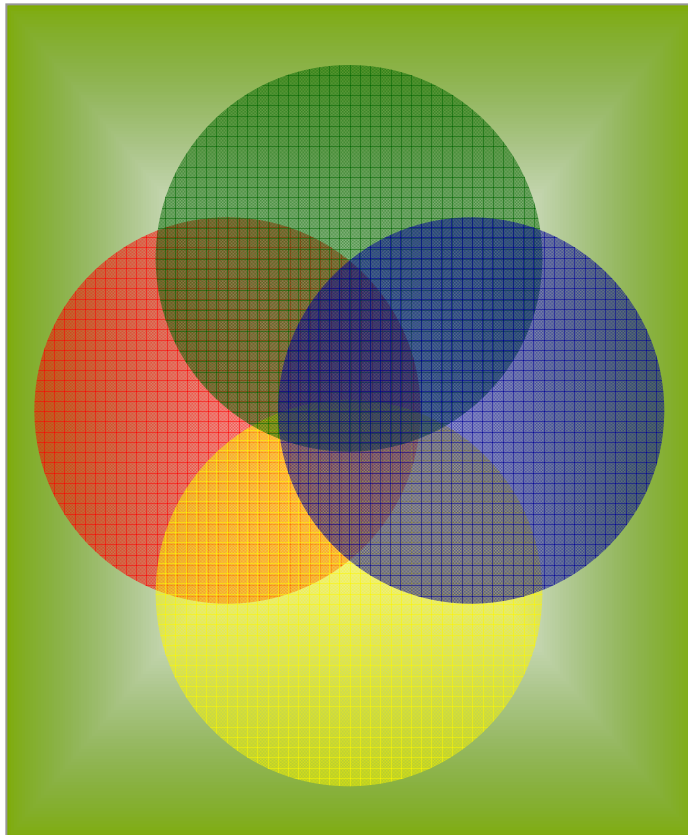
sugar & starch crops

oil crops

## Limitations :

- Competing land use issues – food vs fuel
- Not ideal fuel molecules: material compatibility; handling/quality issues
- Ethanol issues:
  - High vapour pressure
  - Energy content approx 1/3 lower than conventional gasoline
  - Cannot be moved by pipeline
  - Can only be blended at terminals
  - Requires segregated distribution system
  - E85 issues around dispenser certification (safety)

# What is needed?



- ✓ Fuels that can be produced from domestic, renewable resources in high volume and reasonable cost.
- ✓ Fuels that can be used in existing vehicles and existing infrastructure
- ✓ Fuels that offer good value to consumers
- ✓ Success at scale requires 'whole of market' introduction

# Next generation Biofuels



- Advanced bio-fuels respond to all policy drivers - deliver on GHG, security of supply & support agriculture sector
- Biobutanol has a number of attractive properties:
  - Easily blended into gasoline
  - Can use existing fuel infrastructure without major modification
  - Potential to be used at higher blend concentrations than ethanol in unmodified vehicles
  - An energy content closer to that of gasoline than ethanol – reducing the impact on fuel economy for the consumer
- Biobutanol is complementary to ethanol:
  - Can be used together with ethanol
  - It can enhance the performance of ethanol blends in gasoline
  - It can be produced from the same feeds as ethanol



# Challenges to CA LCFS Implementation

further work needed to inform best policy



- Technical feasibility of goals
  - Cost, availability, quality
- Overlap with AB32
  - Not an insurmountable problem but the solution needs to be very clear and well thought out
- Lifecycle methodology
- Baseline
- Clarity on issues around electricity credit generation
- Sustainability issues

# Potential Compliance Strategies



- Advanced biofuels
- Emission reductions in conventional fuel lifecycle
- Potential use of other transport fuels based on their cost effectiveness and materiality

# Public Policy Considerations



- **Carefully balance desire to drive technology with identification of achievable goals. Consider:**
  - Timing of compliance
  - Cost
  - Effect on fuel markets
  - Sustainability
  - Policy review at regular intervals
- **Focus on outcomes, not particular fuels**
- **Consider the advantages of solutions that utilize existing vehicles and infrastructure**
  - These will provide the quickest results at the lowest cost and allow scale
- **Make room for innovation**
  - Yesterday's molecules may not be the best answer for today's vehicle