Life Cycle Analysis Updates

December 2, 2008

California Environmental Protection Agency
Air Resources Board

CA-GREET and Pathway Updates

- The latest release of CA-GREET v1.8b will be available mid December 2008
- Will include updated criteria pollutants results
- Will update current published pathways:
  - Corn ethanol
  - CaRFG and ULSD
  - CNG, H₂, and Electricity
  - Soybean Biodiesel and Land Fill Gas
  - Others
CA-GREET and Pathway Updates (cont.)

- Additional pathways to be published
  - Brazilian sugarcane ethanol
  - Renewable diesel from soybeans
  - LNG (5 sub-pathways)
  - Palm Oil based biodiesel
  - Cellulosic ethanol from forest residue
  - Cellulosic ethanol from farmed trees
  - Renewable diesel from waste
  - GTL from natural gas

Land Use Change: Ongoing Work

Presented preliminary land use change impact estimates for corn ethanol at October 16th workshop:

- Used GTAP to estimate total impact
- Annualized results over 30 years
- Preliminary estimate of 35g CO₂e/MJ
Land Use Change for Other Biofuels

Land use change impact estimates in progress for:

- Biodiesel
- Sugarcane ethanol
- Cellulosic Ethanol

Land Use Change: Ongoing Work

Refinements to the modeling in process:

- Inclusion of Conservation Reserve Program (CRP) and/or currently unmanaged lands
- Development of comprehensive uncertainty estimates
- Incorporation of Winrock emission factors
- Accounting for time in GHG emissions from land use change
Land Use Change for Conventional and Unconventional Fossil Fuels

Preliminary estimates available but being reviewed

- Crude from California Oil Fields
- Crude from Canadian Oil Fields
- Oil Sands from Alberta, Canada

Questions/Comments

- Anil Prabhu at 916-327-1501 or via e-mail at aprabhu@arb.ca.gov
- John Courtis at 916-323-2661 or via e-mail at jcourtis@arb.ca.gov
- Dean Simeroth at 916-322-6020 or via e-mail at dsimerot@arb.ca.gov