



# California's Low Carbon Fuel Standard

September 13, 2007





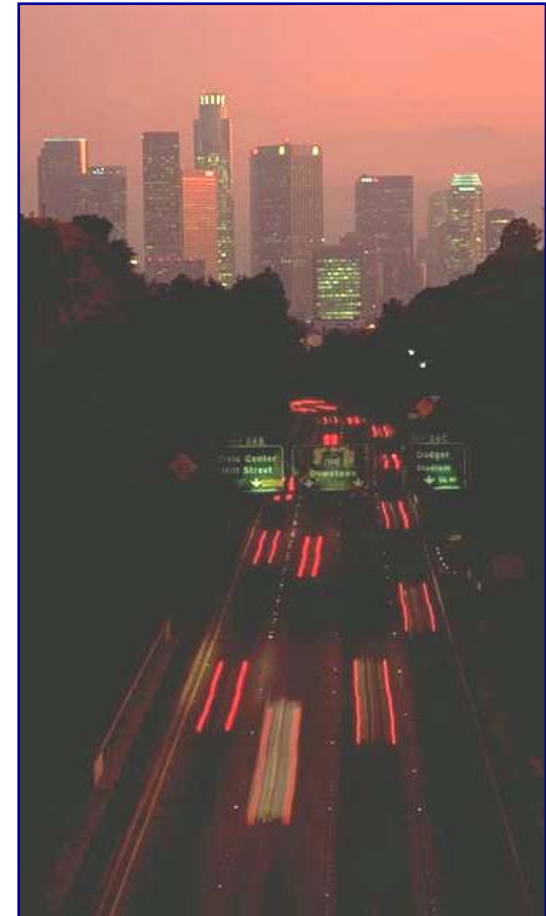
# Agenda

- Introduction and workshop overview
- Presentation
  - Background
  - Development of LCFS
  - Presentation by UC
  - Presentation by USEPA
  - Presentation by CEC
  - Process
  - Technical working groups
  - Schedule
- Discussion
- Next meeting



# Reduce Carbon Intensity of Transportation Fuel

- A statewide goal to reduce the *carbon intensity* of California's transportation fuels by at least 10 percent by 2020
- Goal will be accomplished by establishing a **Low Carbon Fuel Standard** ("LCFS") for transportation fuels sold in California





# Rationale for LCFS

- Required to meet the GHG reduction goals of AB 32
- Executive Order S-01-07 directed ARB to determine if a LCFS can be adopted as a discrete early action measure
- June 21, 2007 hearing, the Board approved LCFS to be one of the discrete early action measures





# Benefits of LCFS

- Help to meet the GHG reduction goals of AB32
- Reduce dependency on petroleum-based fuels by displacing 20% gasoline consumption
- Diversify California's options for transportation fuels





## LCFS Benefits (Cont')

- Create a market for low carbon fuels and a stable investment environment
- Enlarge renewable fuels market by expanding California's alternative fuels markets by 3 to 5 times, while reducing GHG emissions
- Promote direction of technology innovation with lower carbon foot-print
- Promote more alternative fuel and hybrid vehicles



# Potential Lower or Very Low Carbon Fuels

- Lower carbon ethanol from more efficient corn conversion processes or sugar cane
- Very low carbon ethanol from “cellulosic” materials that have 4-5 times lower GHGs than today’s corn
- E10: increase ethanol blend from current 5.7%
- E85: high blend ethanol for flex fuel vehicles
- Biogas, Biodiesel, Renewable Diesel, Biobutanol
- Electricity and Hydrogen
- CNG, LNG, LPG





# Development of LCFS: UC Reports

- University of California Study: A Low-Carbon Fuel Standard for California
  - Part 1: Technical Analysis
  - Part 2: Policy Analysis
- Serve as basis for LCFS
- Both reports available on ARB's Low Carbon Fuel Standard Program website at <http://arb.ca.gov/fuels/lcfs/lcfs.htm>





# **Presentation by UC**



# **Presentation by USEPA**



# Presentation by CEC



# AB 1007

- **AB 1007 requires CEC, in cooperation with ARB and other state agencies, to develop and adopt a state plan to increase the use of alternative transportation fuels**
  - Alternative fuel defined as nonpetroleum fuel, including electricity, ethanol, biodiesel, hydrogen, methanol, or natural gas
  
- **One component of the plan is a *full fuel cycle assessment* of alternative transportation fuels considering emissions of**
  - Criteria air pollutants
  - Air toxics
  - Greenhouse gases
  - Water pollutants
  - Other substances that are known to damage human health
  
- **The plan set goals for 2012, 2017, 2022, 2030, and 2050**



# Development of LCFS: Key Principles

- **Governs intensity.** Not amount of fuel sold
- **Measured on lifecycle basis.** Fuel providers must decrease overall greenhouse gas emissions
- **Market-based.** Allows averaging, banking and trading to lower cost and provide flexibility
- **Performance-based.** Sets carbon reduction standards and methods to calculate compliance
- **Fuel-neutral.** Fuel providers can choose which fuels to sell and in what volumes



# Development of LCFS: Flexible Options for Compliance

Fuel providers will have different options by which to comply, including:

- Only produce fuels that meet the standard
- Selling a mix of higher and lower carbon fuels that on average meet the standard
- Using previously banked credits
- Purchasing credits from other fuel providers who earned credits by exceeding the standard



# LCFS Development Process

- **Initiate public workshops**
  - Initiate the public workshop process
  - Workshop meetings **every 4-6 weeks**
- **Establish working groups**
  - Establish **4** working groups to concentrate on specific areas of the LCFS
  - Meet between workshops
  - Present information for workshops



# LCFS Development Process (cont')

- **Coordinate activities**
  - Coordinate with other California State agencies (CEC, others), USEPA, EU, UK, and other international organizations
  
- **Initiate work**
  - Using UC work as the basis, initiate work on areas where additional information/data are required
  - UC and others provide assistance





# **Proposed LCFS Working Groups**



# Proposed LCFS Working Groups

<b>#</b>	<b>Group Topic</b>	<b>Lead ARB Staff</b>
1	Lifecycle	Anil Prahbu
2	Compliance and Enforcement	Jing Yuan
3	Policy and Regulatory Development	Christina Zhang-Tillman
4	Environmental and Economic	Reza Lorestany



# Lifecycle Group #1 Work Items

- **Lifecycle GHG Determinations**
  - Land use (sustainability)
  - Default values
  - Uncertainty of values
  - Production pathways
  - Environmental justice
  - Other issues





# Compliance and Enforcement Group #2 Work Items

- **Implementation System**
  - Tracking fuels and feedstocks
  - Certification of feedstocks
  - Others



# Policy and Regulatory Development Group #3 Work Items

- **Harmonization and consistency with USEPA, EU, International LCFS systems**
- **Cap and trade issues**
- **Upstream emissions**
  - Refining, conventional and non-conventional crude weightings
- **World Trade Organization issues**
- **Credit vehicle or fuel?**
  - Diesel
  - Electricity producers
  - PHEV and electric vehicles
  - Innovation credits (e.g. CCS)
- **Vehicle efficiency issues**





# Environmental and Economic Group #4 Work Items

- **Economics evaluation**
- **Multimedia Evaluation**



# AB 32 Timeline

**2007**

**Publish list of early actions**

**2008**

**Mandatory reporting & 1990 Baseline**

**2009**

**Publish scoping plan**

**2010**

**Adopt enforceable early action regulations**

**2011**

**GHG reduction measures adopted**

**2012**

**GHG reduction measures operative**

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**2020**

**Reduce GHG emissions to 1990 levels**

**Beyond**

**Continue to identify and implement further emission reduction strategies**



# LCFS Schedule

<b>2007</b>	University of California completes LCFS study with CEC & ARB
<b>2007-2008</b>	Conduct LCFS workshops
<b>Early 2008</b>	Initiate draft regulatory language
<b>Fall 2008</b>	Regulatory package completed
<b>End of 2008</b>	LCFS regulation submitted to the Board for consideration
<b>2009</b>	Regulation submitted to Office of Administrative Law
<b>2010-2020</b>	Implementation





# Next Steps

- Begin working group meetings
- Next workshop in the 2<sup>nd</sup> half of October



# Staff Contact Information

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# To Join Working Group(s)

Email **Christina Zhang-Tillman** at  
[czhangti@arb.ca.gov](mailto:czhangti@arb.ca.gov)

- Subject line “LCFS WG Signup”
- Indicate the group number(s) and topic(s) to join

Group #	Group Topic
1	Lifecycle
2	Compliance and Enforcement
3	Policy and Regulatory Development
4	Environmental and Economic