

Low Carbon Fuel Standard Workshop:

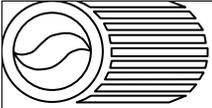
Introduction and Meeting Overview

March 27, 2009

California Environmental Protection Agency

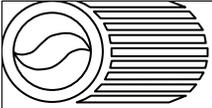


Air Resources Board



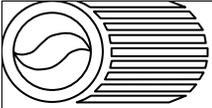
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Air Resources Board
1001 I Street
Sacramento, California 95814
- Electronic submittal:
<http://www.arb.ca.gov/lispub/comm/bclist.php>
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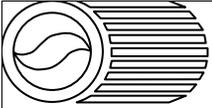


Today's Meeting Agenda

1. Introduction and Meeting Overview
2. General Discussion of Proposed Regulation
3. Economic Impacts Analysis

12:00 – 1:00 Lunch

4. Fuel Pathways and Land Use Change
5. Environmental Impacts Analysis
6. Next Steps



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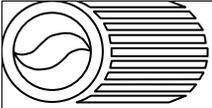
Life Cycle Analysis:

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Environmental Analysis:

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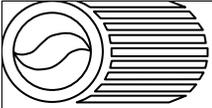
Economic Analysis:

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Manager, Program Assistance Section

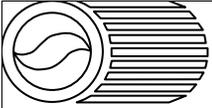
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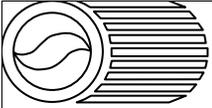
Low Carbon Fuel Standard Workshop:

*General Discussion of
Proposed Regulation*



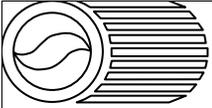
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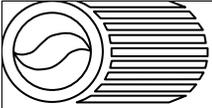
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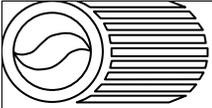
General Discussion

- Questions?

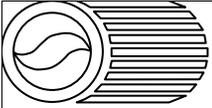
- Comments



- Presentation by Others

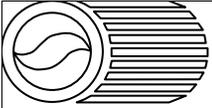


Low Carbon Fuel Standard Workshop: Economic Analysis Summary



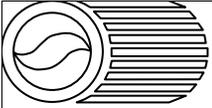
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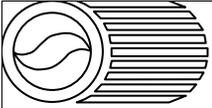


Economic Analysis

- **December 2008 Workshop**
 - Presented methodology
 - Distributed 7-page support document

- **January 2009 Workshop**
 - Reviewed methodology
 - Presented cost assumptions
 - Presented preliminary results

- **March 2009 Staff Report**
 - Economic analysis in Chapter VIII
 - Goal to be transparent on entire analysis

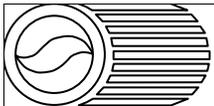


Today's Discussion

- Assumptions
- Calculations
- Conclusions



Questions?



Contacts

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Alternative Fuel Costs

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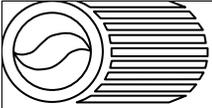
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Economic Analysis

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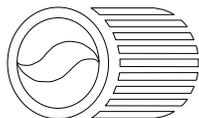
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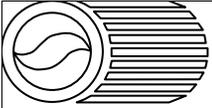
Life Cycle Analysis and Land Use Change

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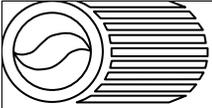


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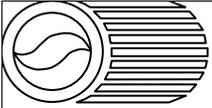
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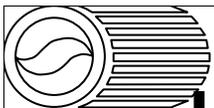
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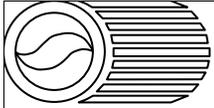
Fuel Pathways

Completed	Under Development
CARBOB	Sugarcane Ethanol (using bagasse for electricity and mechanized harvesting of cane)
CaRFG	Cellulosic Ethanol (Farmed Trees, Municipal Waste, Ag. Waste, Forest Waste)
Corn Ethanol (11 sub-pathways)	Biodiesel (Soybeans, Yellow Grease, Fats, Waste Oil, Palm Oil)
Sugarcane Ethanol (Brazilian)	Renewable Diesel (Soybeans, Yellow Grease, Fats, Waste Oil, Palm Oil)
Electricity (2 sub-pathways)	Crude (Oil Sands, Oil Shale)
Hydrogen (4 sub-pathways)	CNG (Digester Gas, Regasified LNG)
ULSD	LNG (Remote NG, Landfill Gas)
CNG (3 sub-pathways)	



Look Up Table Carbon Intensity (gCO₂e/MJ)

Fuels	Description	CI
CARBOB	Average CA	95.86
CaRFG	Average CA	95.85
ULSD	Average CA	94.71
CNG	Average North America	68.00
	Landfill Gas	11.26
Electricity	CA Average Mix	124.10
	Marginal	104.70
H₂ (liquid)	Central Reforming (NG)	133.00
H₂ (gaseous)	Central Reforming (NG)	142.20
	Onsite Reforming (NG)	98.30
	Onsite Reforming (compliant with SB1505, NG and Renewable)	76.10
Corn Ethanol	CA Average (80% Midwest, 20% CA)	95.66
Sugarcane Ethanol	Brazilian Average	73.40

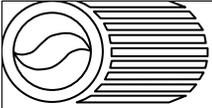


Other Fuels - Carbon Intensity (gCO₂e/MJ)- Preliminary

Fuels	Description	CA-GREET
Ethanol	Farmed Trees, Fermentation	20.40*
	Forest Waste, Gasification	22.20
Biodiesel	Soybean, FAME	68.93**
Renewable Diesel	Soybean, Hydrogenation process	70.80**
	Tallow, Hydrotreating process	15.0

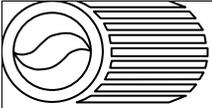
* Preliminary LUC value of 18 g CO₂e/MJ is added to the CA-GREET value

** Preliminary LUC value estimated at 42 g CO₂e/MJ is added to the CA-GREET value

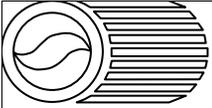


Questions/Comments

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- Dean Simeroth at 916-322-6020 or via e-mail at dsimerot@arb.ca.gov

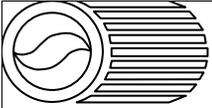


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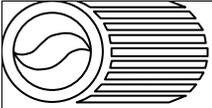
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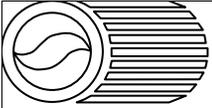
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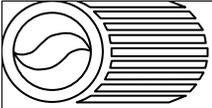
Environmental Impacts

- Greenhouse Emissions Reductions by 2020
 - 16 MMT CO₂e (fuel combustion)
 - 23 MMT CO₂e (full fuel lifecycle)
- No Adverse Air Quality Impacts Due to Criteria Pollutants
- Currently Evaluating Toxic Air Pollutant Emissions



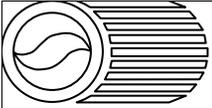
Emissions from Biorefineries

- Emissions from facilities are expected to be mitigated due to local permitting and CEQA requirements (18 cellulosic ethanol, 6 biodiesel)
- Staff is committed to the development of a “Best Practices” guidance document specific for the siting of these new facilities
- Staff is working internally on the method for evaluating impacts on already adversely impacted communities



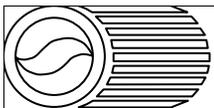
Local Health Risk Assessment

- Cancer Risk 0.4 Chances per Million On-site Emissions
- Cancer Risk >5 Chances per Million Combined On-site and Off-site Emissions



Regional Health Impacts

- 24 Premature Deaths
- 8 Hospital Emissions
- 370 Cases of Asthma, Acute Bronchitis, and Other Lower Respiratory Symptoms



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