



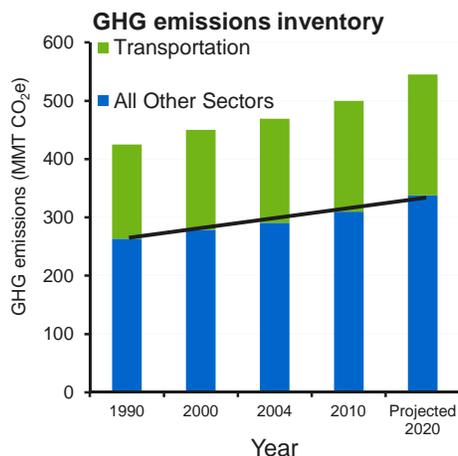
Board Update on LCFS Program Review and Sustainability

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Overview

- LCFS Overview
- Formal LCFS Program Review
- Sustainability Activities

Transportation Emissions Increasing



- GHG emissions increasing
- Transportation sector about 40 percent of GHG emissions in 2020
- Large reductions necessary to offset growth

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GHG Programs for Transportation

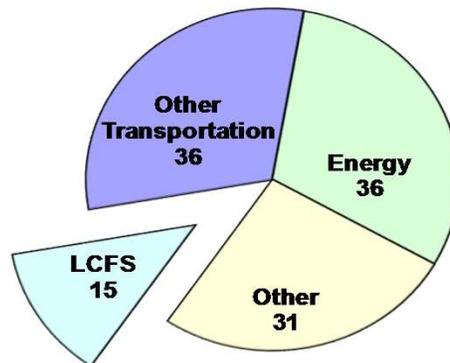
- **Fuels**
 - Low Carbon Fuel Standard - 2009
- **Vehicle GHG Emissions Standards**
 - Pavley Standards - 2004
 - Advanced Clean Cars – 2012 (proposed)
- **Vehicle Miles Traveled**
 - Sustainable Communities (SB 375) - 2010

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LCFS - 3rd Largest GHG Measure

Achieves 13% of AB 32 reductions



**Estimated 2020 Scoping Plan Reductions
(MMTCO₂e)**

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Additional Objectives of LCFS

- Spur innovation and investment in clean fuels
- Transform CA transportation fuel pool:
- Create durable framework for near- and long-term transition to low carbon fuels
- Establish a model for regional and national standards

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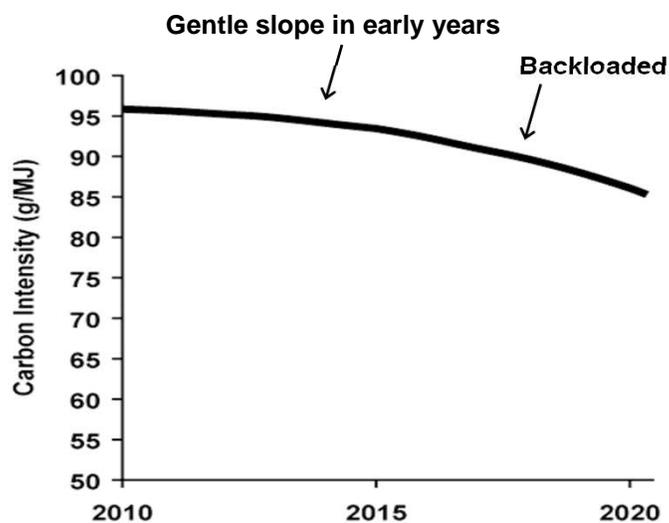
Basic LCFS Requirements

- Sets annual carbon intensity standards for gasoline, diesel, and fuels that replace them
- Carbon intensity is measure of energy required to produce a fuel and is surrogate for GHG emissions
- Carbon intensity based on lifecycle analysis
- Performance standard requires 10% reduction in carbon intensity by 2020

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Provides Time for Needed Biofuel Advances



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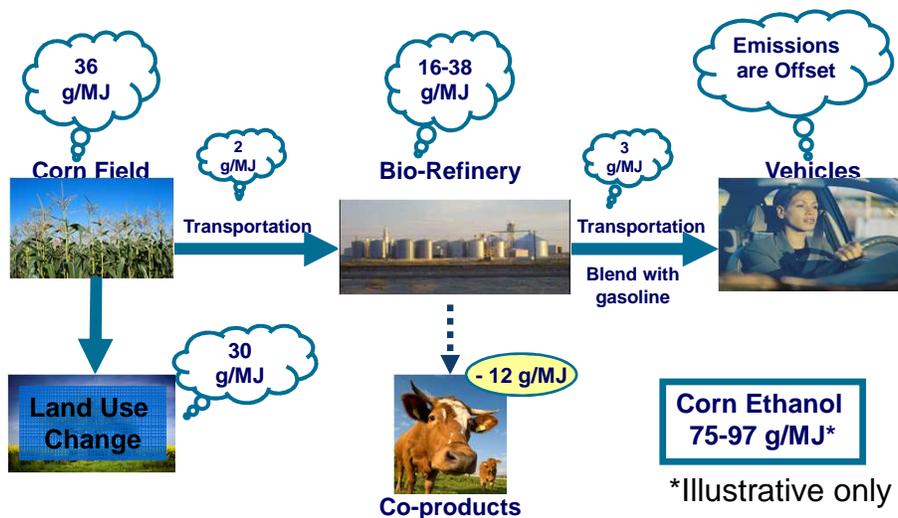
LCFS Accounts for Lifecycle Emissions

- Carbon intensity includes both direct and indirect emissions
 - Direct: well-to-wheel; seed-to-wheel
 - Indirect emissions: Land use change
- Carbon intensity of fuels can vary significantly
- Proper accounting sends clear signal to reduce carbon intensity of transportation fuels

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Foundation of LCFS: Lifecycle Assessment



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LCFS Applies to Regulated Parties

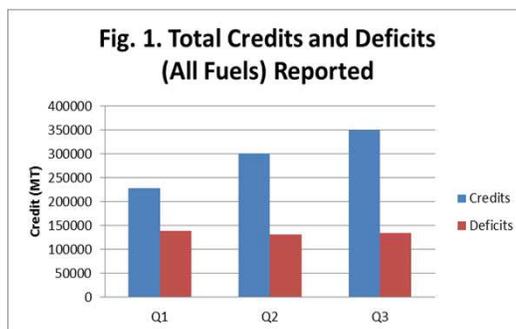
- Providers of most petroleum and biofuels are 'regulated parties' under the LCFS
- Providers of clean fuels that already meet 2020 target are exempt but can 'opt in' program and earn credits
- Generated credits can be bought and sold by regulated parties

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LCFS Working As Designed

- Program in its early years
- Working as designed
- Approximately 70 fuel providers are reporting & complying
- Innovations are occurring

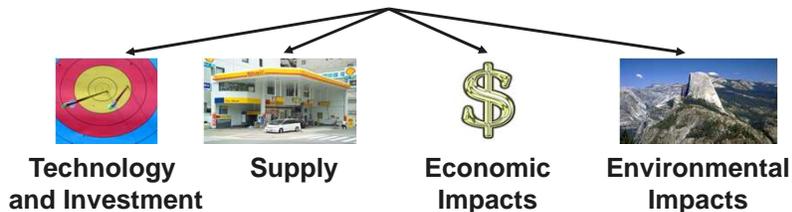


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Scope of Formal Program Review

- Advisory Panel formed to assist staff
- Review covers various topics:



- Topics added for review

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Formation of Advisory Panel

- Objective: Establish a diverse Advisory Panel of experts to reflect the best information and perspectives
- Broad solicitation for applications
- Panel includes:
 - Fuel providers
 - Environmental organizations
 - Vehicle manufacturers
 - Economic experts
 - Government agencies
 - Academia

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Role of Advisory Panel

- Focus on high level review
- Complement efforts of technical workgroups
- Assist ARB staff by:
 - Reviewing/commenting on work
 - Suggesting other topics for study
 - Identifying additional information
 - Conducting independent analyses
- Panelists available for ongoing consultation



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Extensive Public Process

- Panel convened five times, one supplemental meeting
- Two public workshops
- Individual meetings
- All panelist and public comments posted online

Meeting	Activity
February 16, 2011	Panel Meeting
April 26, 2011	Panel Meeting
June 30-July 1, 2011	Panel Meeting
July 25, 2011	Public Meeting
August 25-26, 2011	Panel Meeting
September 29, 2011	Public Meeting
October 27, 2011	Panel Meeting
November 17, 2011	Addn'l Meeting
December 16, 2011	Board Meeting

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Panel Discussions

- Added two topics at Panel's request:



High Carbon
Intensity Crude Oil



Credit Trading

- Wide range of opinions expressed on topics
- Effort made to reflect range of perspectives in program review report

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Themes from Panel Discussions

Program is in its early years:

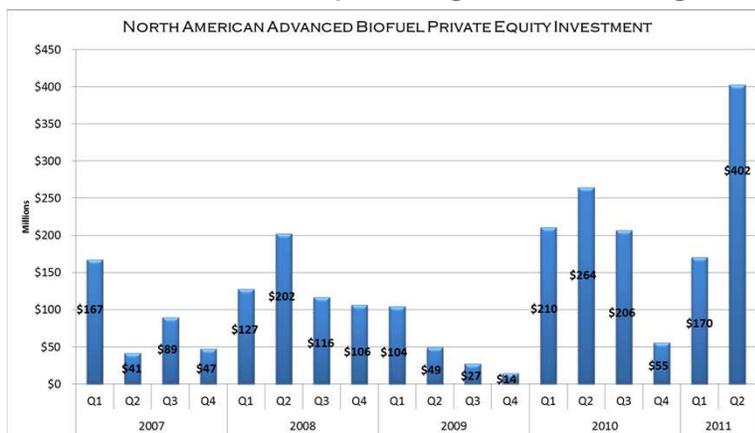
- Market appears to be responding
- Next-generation low carbon fuels likely needed to meet targets in latter years
- Need for continued monitoring and periodic review

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Advanced Biofuel Investments Increasing

Investments responding to market signal



Source: Solecki, Mary et al., "Advanced Biofuel Market Report 2011 – Meeting the California LCFS," Environmental Entrepreneurs (E2), p. 6, rev. Aug. 22, 2011.

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California Biofuel Activity

- Two ethanol plants restarting: 115 MGY
- CEC awarded \$56 million to biofuel projects
- \$45 million in DOE grants awarded to CA businesses
- \$200 million Mendota sugar-beet-to-ethanol plant in planning stage
- 18 of the "Hottest Companies in Bioenergy for 2009-2010" are located in California

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Other Themes from Panel Discussions

Regulatory certainty needed:

- LCFS encourages further innovation and long-term investments

- Clear market signals encourage healthy and robust credit system credit

- Panelists suggested flexible compliance mechanism may enhance regulatory certainty

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Formal Program Review Report

- Final Draft issued December 8, 2011
- Reflects ARB staff assessment as well as range of perspectives from Panelists and public
- Report covers:
 - Technology assessment and fuel supplies
 - Meeting the targets
 - Economic and environmental impacts
 - Assessment of heavy crude and credit market options
 - Harmonization with other programs

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Technology and Fuel Supplies

- Many different technologies in development
- Biofuel investments increasing
- Limited volumes of very low carbon fuel available
- Cellulosic ethanol outlook lower
- Carbon intensity for conventional ethanol improving
- Fuel supplies adequate in the near term

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Meeting the Targets

- Evaluated 16 illustrative scenarios
- Built around various “what-ifs”
 - Cellulosic ethanol availability low
 - Flex fuel vehicles are readily available
 - Very low carbon intensity fuels delayed
- Some scenarios relied on banked credits
- Multiple potential paths possible to compliance
- Ongoing program monitoring necessary
- Next-gen biofuels needed for long-term compliance

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Economic Assessment

- Updated 2009 Economic Analysis
- Results differed among scenarios
- Negligible impacts in gasoline scenarios
- No near-term impacts in diesel scenarios
- Work with CEC and stakeholders on refined analysis

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Environmental Assessment

- Continual staff monitoring since 2009
- Staff found no changes to the 2009 environmental impacts analysis
- Released district guidance on biorefinery siting practices
- Recommended Actions:
 - Continue multimedia evaluations of emerging fuels
 - Sustainability work continue

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Other Program Review Topics

- High Carbon Intensity Crude Oil
- Credit Trading
- Status of Lifecycle Analyses
- Harmonization with Other Programs

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Program Review Conclusions

- Early phase of implementation - program is working
- Credits being accrued and carbon intensities progressively decreasing
- Further refinements can help ensure long-term compliance
- Regulatory certainty is a key driver to maintain clear market signal to trigger investments
- Substantial investments in next generation biofuels needed for long-term success

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Program Review Next Steps

- Finalize Formal Program Review Report
- Address specific tasks from Advisory Panel effort
 - Flexible compliance mechanisms
 - Potential expansion of credit market
 - Updated economic assessment
- Complete next formal review by January 1, 2015
- Update Board annually

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Update on LCFS Sustainability Activities

- Board directed staff to develop sustainability provisions
- Sustainability: Ability to meet the needs of the present generations without compromising the ability of future generations to meet their needs
- Three parts to consider: environmental, social, and economic sustainability

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Sustainability Activities

- Board approved the Workplan in May 2010
- Established Sustainability Workgroup (SWG)
 - Forestry
 - NGOs
 - Academia
 - Other State agencies
 - Regulated parties
- Drafted core sustainability principles for biofuels
- Currently developing criteria and indicators by which sustainability can be measured

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Sustainability Approach

- Voluntary program
 - Trade and commerce issues
 - Evaluating reporting requirements
- Evaluating third-party certification
 - Numerous certification programs can play key role in sustainability determination
- Evaluating role of incentives
 - Proof of sustainability has a cost
 - Sustainable practices should be rewarded

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Sustainability Status

- Environmental Principles
 - Soil, water, air, biodiversity
 - Several meetings with panels of speakers
 - Distributed draft principles and criteria for comments
- Social Principles
 - Human and labor rights
 - Working with experts on International Labor Organization and others

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Sustainability Next Steps

- Finish draft social sustainability provisions
- Address:
 - Economic sustainability
 - Group certification
 - Chain of custody
 - Reporting requirements
 - Incentives
- Draft overall LCFS sustainability provisions
- Return with recommendations
- May be policy/regulatory combination

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Summary

- LCFS is working as designed
- Ongoing monitoring of program implementation important
- No Board action required on Formal Program Review or sustainability activities