



Low Carbon Fuel Standard

Board Update
November 18, 2010



California Air Resources Board

Low Carbon Fuel Standard

- **Background**
- **Progress to Date**
 - Emergence of Biofuels Industry
 - LCFS Implementation
- **Next Steps**
 - Ongoing Efforts
 - 2011 LCFS Implementation



Background: Low Carbon Fuel Standard

- **Results in a 10 percent reduction in the carbon intensity (CI) of transportation fuels by 2020**
- **Reduces 16 MMT GHG emissions from the transportation sector by 2020**
- **Achieves about 10 percent of the total emission reductions required to meet the AB 32 target**
- **Reduces petroleum use; supports investment and jobs in green transportation**



2011 Implementation Important

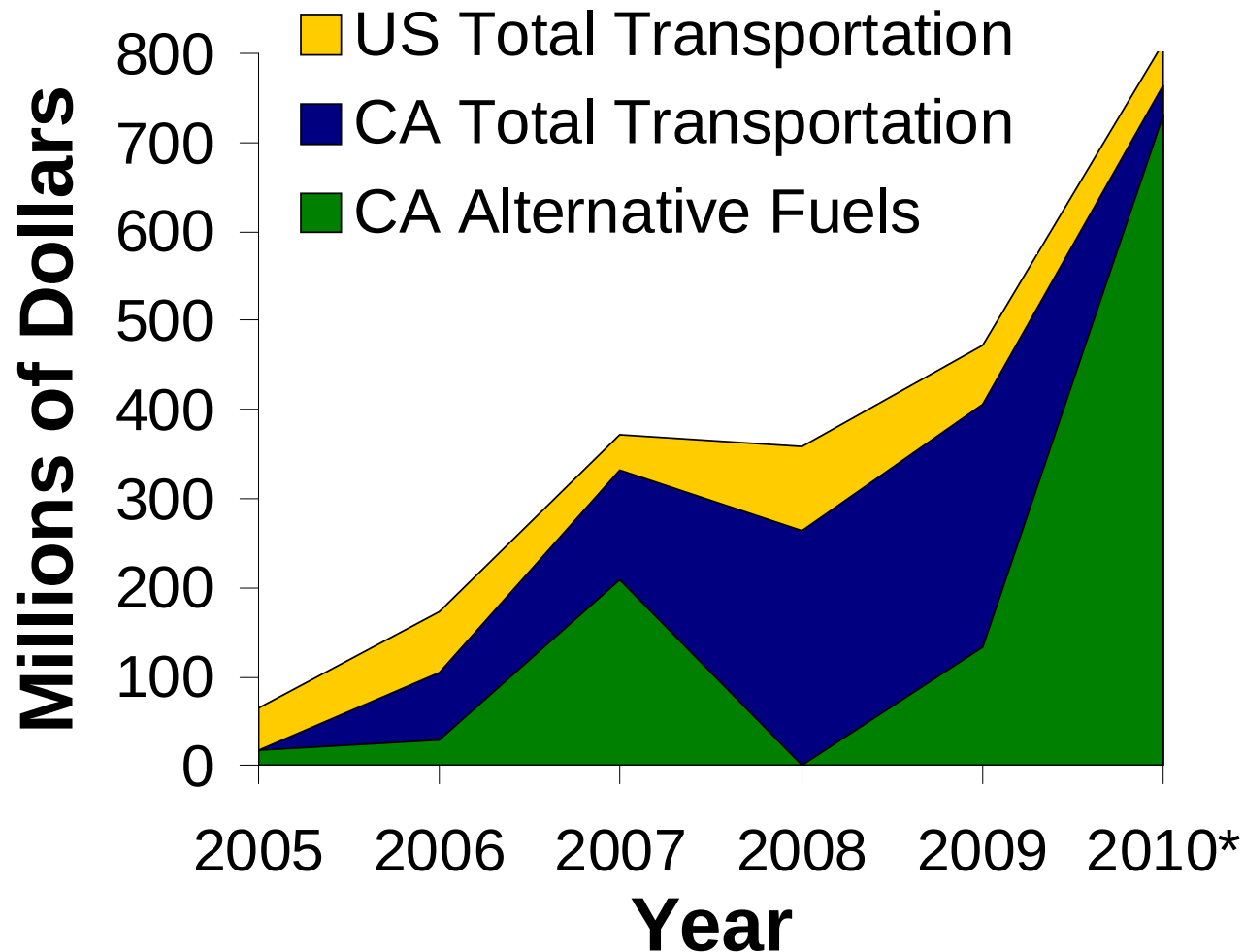
- **Timely implementation in 2011:**
 - **Is a significant and important step in California's efforts to reduce greenhouse gas emissions from motor vehicles; and**
 - **Is critical for protecting the health, safety, and welfare of the State's citizens and its environment.**



California Clean Fuel Economy

- **Two ethanol plants restarting: 115 MGY**
- **CEC awarded \$4.96 million to four biofuel projects this month**
- **\$45 million in DOE grants awarded to CA businesses**
- **\$200 million Mendota sugar-beet-to-ethanol plant in planning stage**
- **18 of the “50 Hottest Companies in Bioenergy for 2009-2010” are located in California**

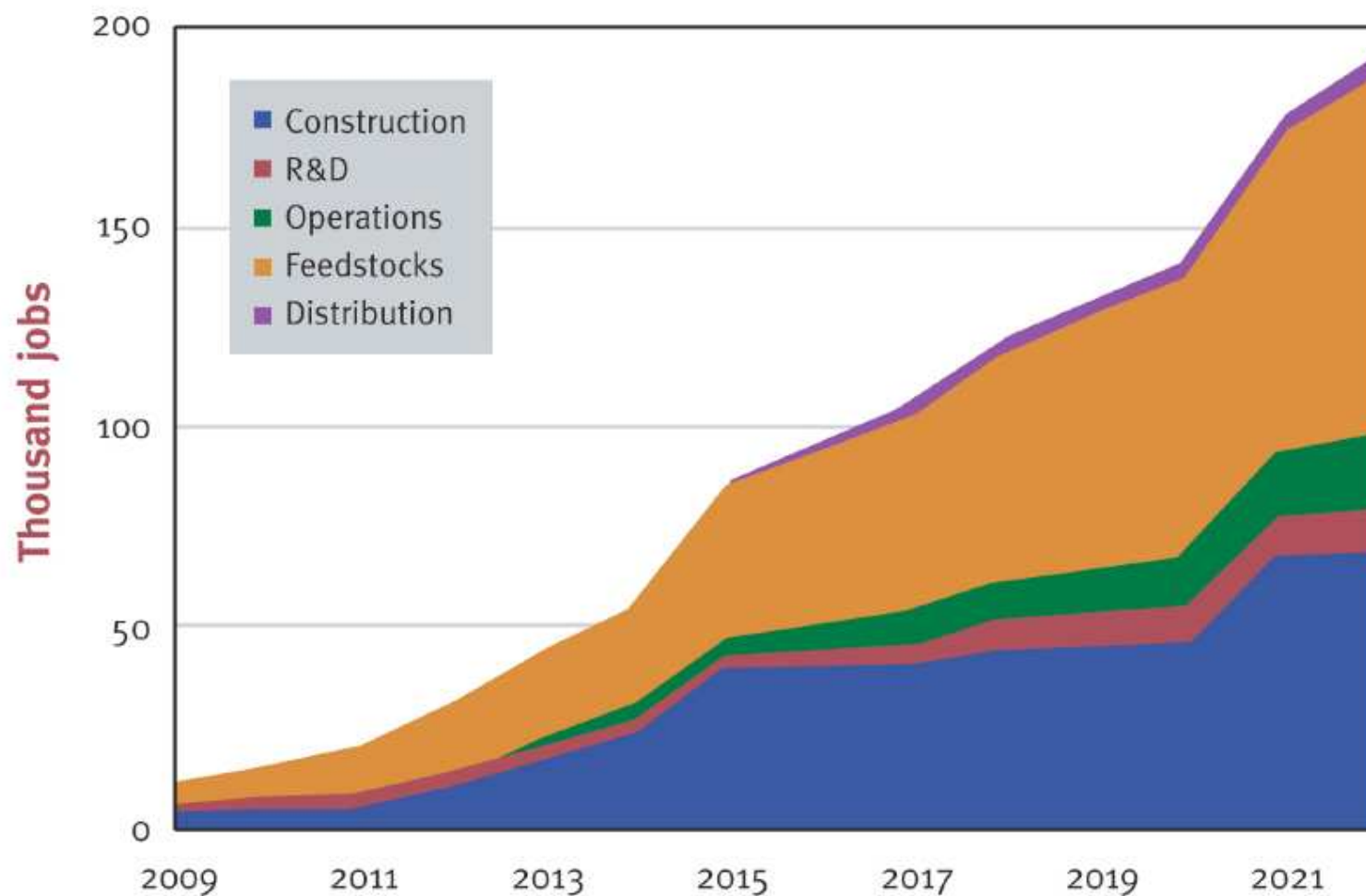
Venture Capital Investments in Green Transportation



* Data current to November 2010

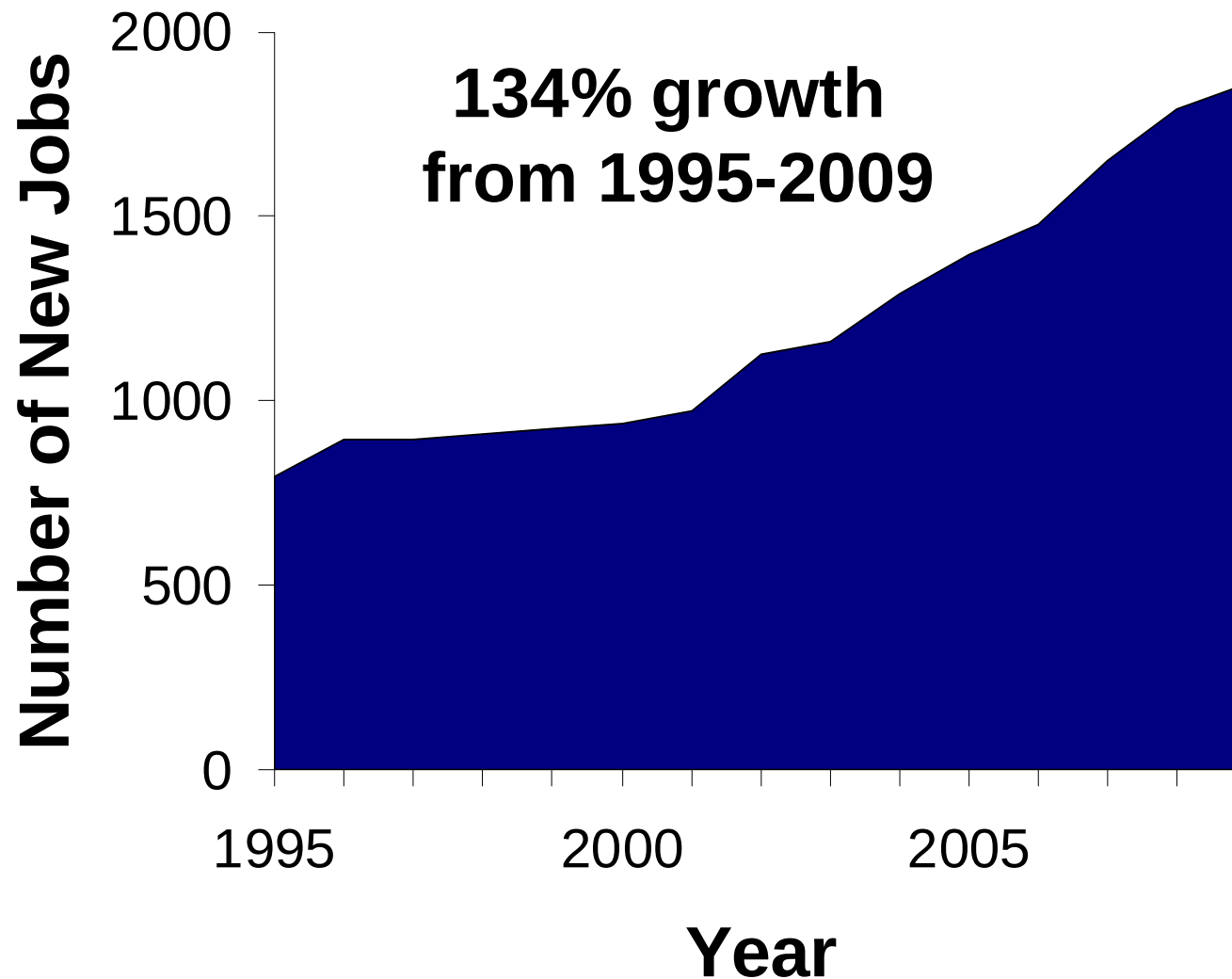
Data Source: Cleantech Group™, LLC (www.cleantech.com)

Projected Job Growth in US for Advanced Biofuel Production



7 Graph from: US Economic Impact of Advanced Biofuels Production: Perspectives to 2030, bio-era, Feb 2009

Alternative Fuels Job Growth in California





Progress on Program Implementation

- **Key Progress Areas**
 - **Low carbon fuel standard reporting tool**
 - **Expert workgroup on land use and other indirect effects**
 - **Biorefinery registration program**
 - **New and modified fuel pathways**
 - **Screening process for crude oils**
 - **Credit trading program**
 - **Advisory Panel**



LCFS Reporting Tool

- **ARB initiative to provide a secure web-based data collection and report generation system**
- **Assists regulated parties with compliance**
- **Enhances ARB enforcement efforts**
- **Official version released November 2010**
- **Additional enhancements ongoing**



Expert Workgroup

- **Convened at the Board's direction**
- **Includes international experts from industry, academia, NGO, and government**
- **Nine subgroups formed to evaluate elements of land use change and indirect effects analysis of transportation fuels**
- **Recently completed draft recommendations from each subgroup posted on ARB website**





Basis for Preliminary Staff Recommendations

- **Draft final subgroup recommendations**
- **Analysis of an updated Purdue University study of land use changes for ethanol**
- **Independent contractor assessments of the Purdue modeling**
- **Subject to change based on additional analysis and public comment**



Preliminary Review of Purdue Analysis

- The new Purdue analysis included three modeling approaches for estimating LUC
- Staff supports Subgroup recommendation that ARB use the “Group 2” simulation methodology as basis for future analysis
- Recommendation incorporates an update of the economic baseline from 2001 to 2006
- This change reduces land use change for corn ethanol by about 50 percent



Preliminary Review of Purdue Analysis

- **Other updates in the new Purdue analysis**
 1. **Cropland pasture in U.S. and Brazil**
 2. **Energy sector supply and demand elasticities**
 3. **Treatment of co-products**
 4. **Structure of the livestock sector**
 5. **Productivity of new cropland**
 6. **Yield response to higher crop prices**
 7. **Emission factors**
- **Staff proposes to support updates one through five above; additional analysis required on the last two**



Other Near-Term Recommendations

- **ARB staff supports the following additional near-term recommendations:**
 - **Revise the sugarcane ethanol and soy biodiesel land use change using the updated GTAP model**
 - **Adopt consistent set of inputs for biofuel pathways**
 - **Re-evaluate the distillers grain co-product credit**
 - **Better understand changes in food consumption predicted by the new model version**
 - **Assess/justify time accounting methodologies**
 - **Continue to update/improve the land pools considered as accessible in GTAP**
 - **Continue to address the indirect effects of conventional fuels**
- **Impact of these changes is unknown**



Next Steps

- **Complete contracts for additional analyses of key inputs**
- **Assess subgroup recommendations**
- **Present analysis for public comment**
- **Propose amendments for Board consideration in the Spring of 2011, or as expeditiously as practical afterward**



Biorefinery Registration Program

- **Regulation specifies carbon intensity for many common fuel pathways**
- **Staff developed voluntary biorefinery registration program**
- **Approximately 60 facilities are currently registered**
- **Facilities represent over 2.8 billion gallons of biofuels**



New and Modified Fuel Pathways

- **Regulation provides option for producers to request new or modified pathway**
- **Guidelines issued to facilitate submittals**
- **Once approved through regulatory process, the value becomes part of the regulation**
- **Current applications in process represent:**
 - **33 facilities**
 - **~1.3 billion gallons of biofuels**



CI for “Generic” Ethanol

- **Lookup table contains carbon intensity value for average Midwestern corn ethanol**
- **The value is 99.4 grams of CO₂e/MJ**
- **Consistent with original intent, staff is clarifying that this value can be used for “generic” ethanol when the source and carbon intensity cannot be reasonably identified**



Crude Oil Screening Process

- **Use of more high-carbon-intensity crude oil (HCICO) than is in the baseline would reduce the anticipated benefit of the LCFS**
- **LCFS mitigates this by requiring HCICO to use an appropriate CI value – higher than the CA average**
- **Staff working with stakeholders to develop screening process to identify potential HCICOs**
- **ARB will maintain a CI list of HCICOs & non-HCICOs**



Interim Approach for HCICO

- **Sufficient information and screening protocols not yet available to help stakeholders determine carbon intensity of HCICO**
- **Need to provide guidance on the use of interim values**
- **Staff proposes to allow use of existing baseline values for a limited time until sufficient information exists to identify and quantify HCICOs**
- **Staff anticipates completing analysis and recommending amendments to the Board in 2011**



Credit Trading System

- **LCFS allows credit trading for compliance beginning in 2011**
- **System under development to streamline process**
 - **Near-term: simplified system**
 - **Long-term: electronic system**
- **Expect credits to be earned in 2011, traded in later years**



Other LCFS Activities

- **“Best Practices” Biorefinery Siting Guidance**
- **Electricity Credits**
- **Sustainability Provisions**
- **Environmental review of specific biofuel projects**
- **Assess Energy Economy Ratios of light- and heavy-duty vehicles**
- **Multimedia evaluation for bio- and renewable diesel**



Advisory Panel

- **Regulation requires external Advisory Panel to support staff in its review of LCFS**
- **Will hold public meetings with reports to Board by January 2012 and January 2015**
- **Staff solicited and is reviewing applications**
- **Appointments will be made in December 2010**
- **First meeting in January 2011**



LCFS Implementation in 2011

- **Requires a modest reduction of 0.25% in carbon intensity as part of gradual ramp-up to 2020**
- **Considered an implementation year with focused enforcement**
- **Provide “generic” CI for ethanol when unknown to ensure full participation of regulated parties**
- **Allow limited use of current baseline value for HCICO**
- **Provide transparency to assure public confidence**



Summary

- **Considerable progress since program was adopted**
- **Prepared for 2011 as implementation year**
- **Need for ongoing flexibility during transition to full implementation**
- **Maintain and build on close collaboration with stakeholders**
- **Return to the Board in 2011 with amendments and updates**



Recommendations

- **Reaffirm staff's activities in fulfillment of Resolution 09-31**
- **Affirm staff's plans for 2011 as necessary and appropriate for implementing the LCFS**