

California Environmental Protection Agency



Air Resources Board

California Low Carbon Fuel Standard

Biofuels Pre-Solicitation Workshop

California Energy Commission

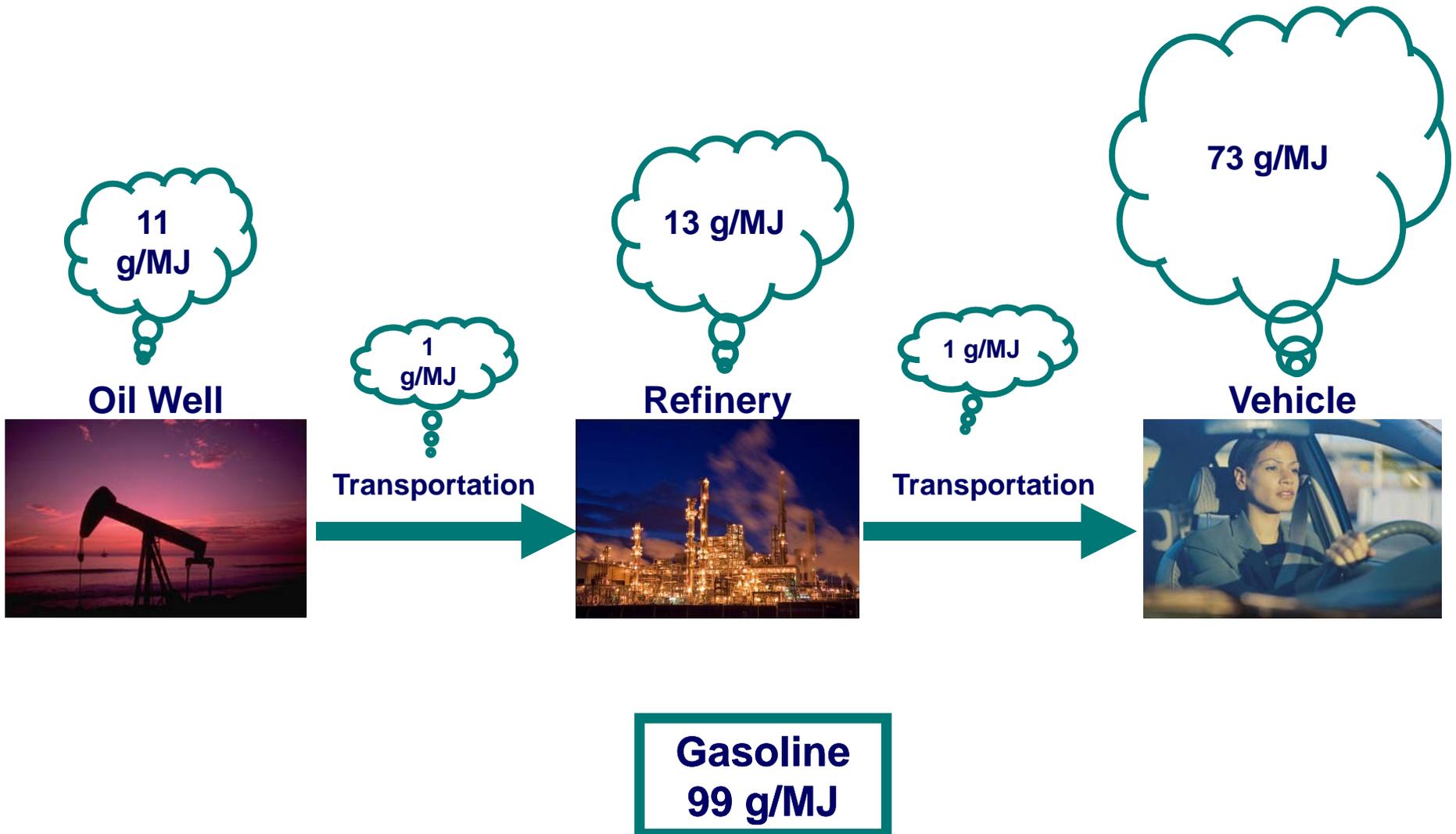
January 11, 2013

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Transportation Fuels Branch**

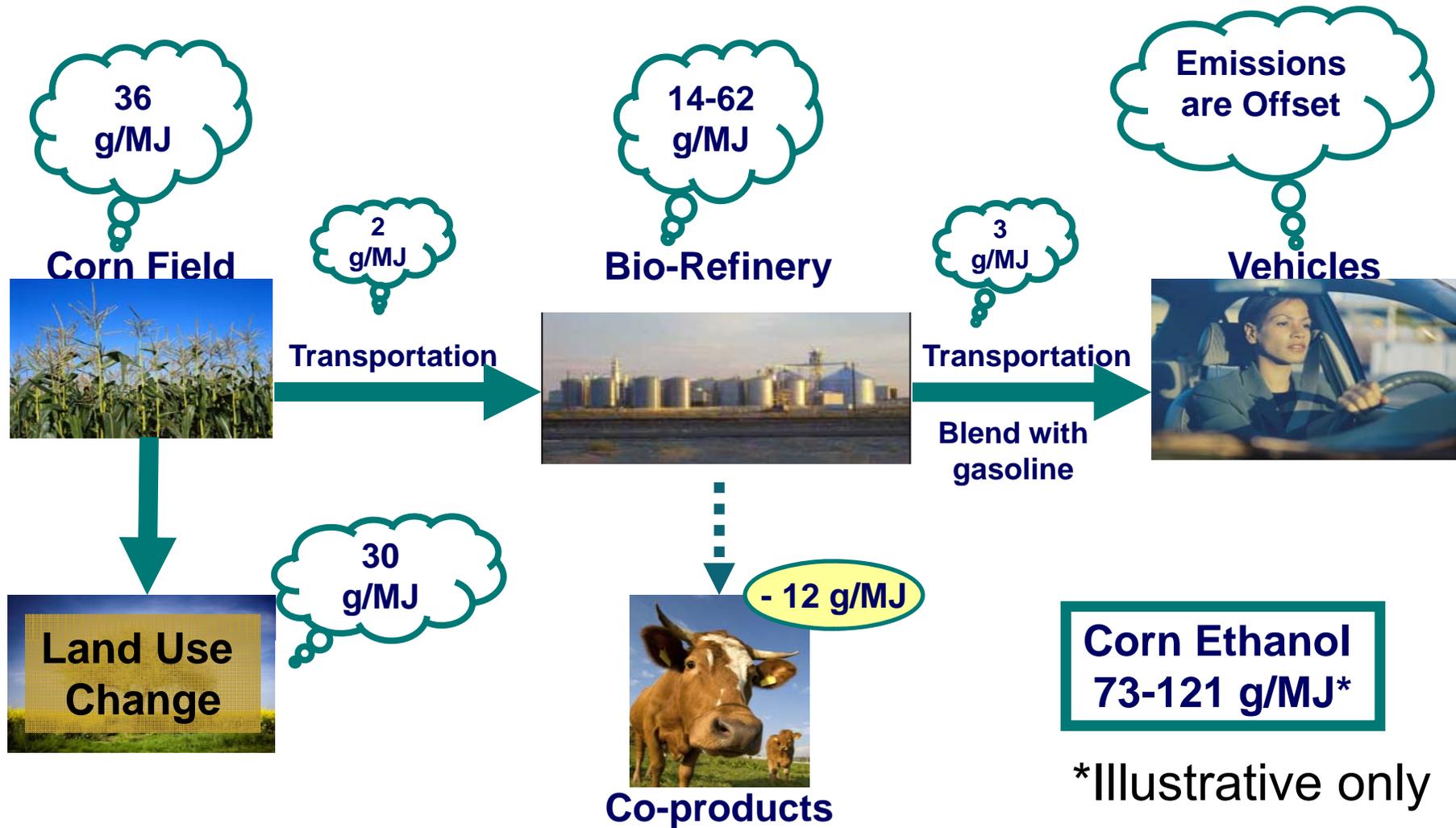
Basic LCFS Requirements

- Sets annual carbon intensity standards for gasoline, diesel, and the fuels that replace them
- Carbon intensity (CI) is the measure of GHG emissions associated with producing and consuming a fuel (gCO₂e/MJ)
- CI based on complete life cycle analysis

Fuel Life Cycle – Gasoline



Fuel Life Cycle – Corn Ethanol



Fuel Pathways

- Fuel pathway CIs are in Lookup Tables in regulation
- Alternative fuel producers may apply for lower CIs
 - Method 2A: at least 5 gCO₂e/MJ lower than Lookup Table value and > 10 million gasoline gallon equivalents sold per year
 - Method 2B: process is not in Lookup Table
- Staff also develops new fuel pathways
- Currently have >170 fuel pathways (gasoline and diesel standards)

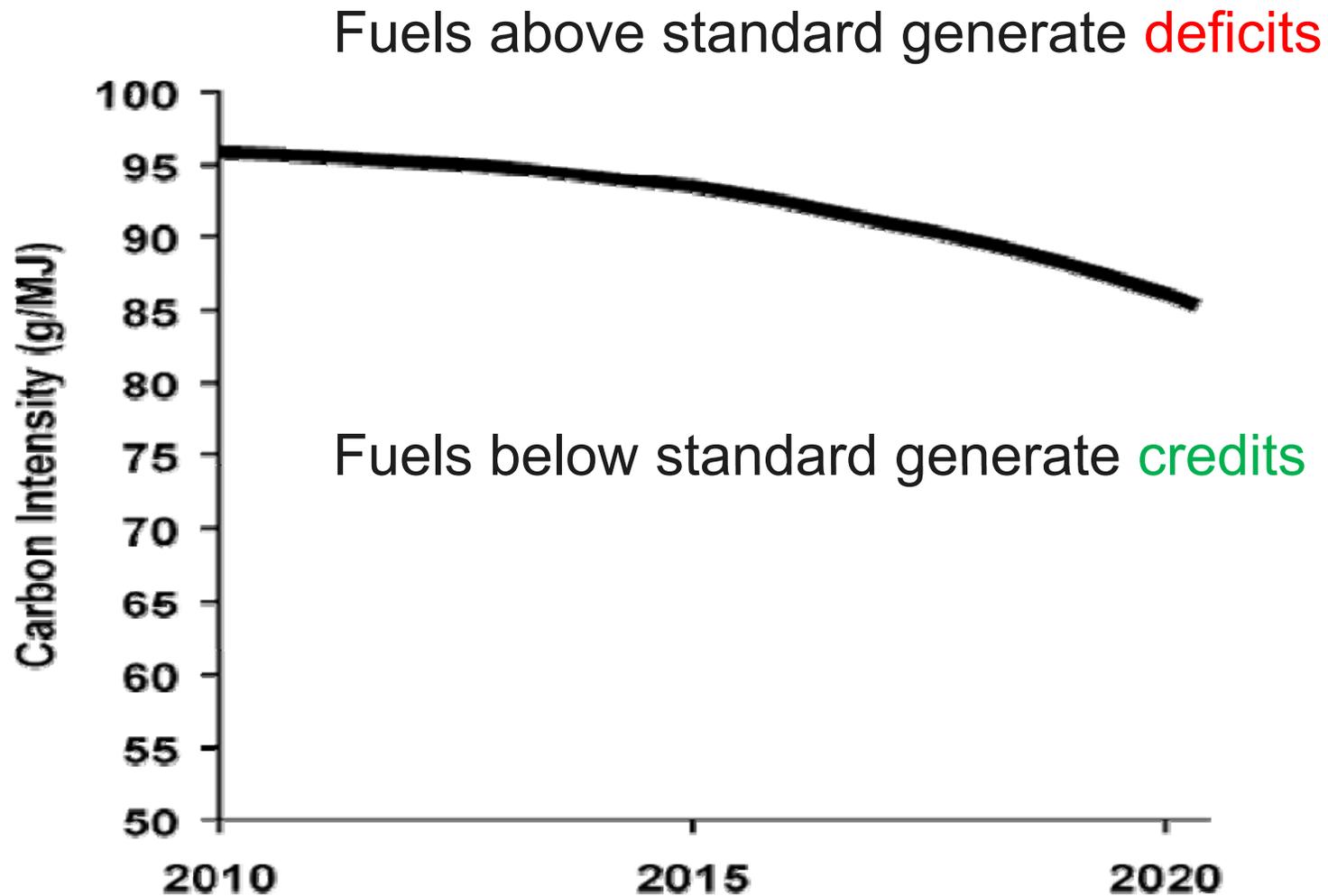
Method 2A/2B Requirements

- Rigorous process
 - Outlined in regulation (pp. 81 – 96)
 - Requires submittal of:
 - CA-GREET model run
 - Detailed process and feedstock descriptions
 - Energy usage (utility bills)
 - Etc.
- Timeline depends on completeness of application

LCFS Applies to Regulated Parties

- Providers in California 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” to program and earn credits
 - Electricity
 - Hydrogen
 - Natural gas & biogas
- Generated credits can be bought and sold by regulated parties

LCFS Credits and Deficits



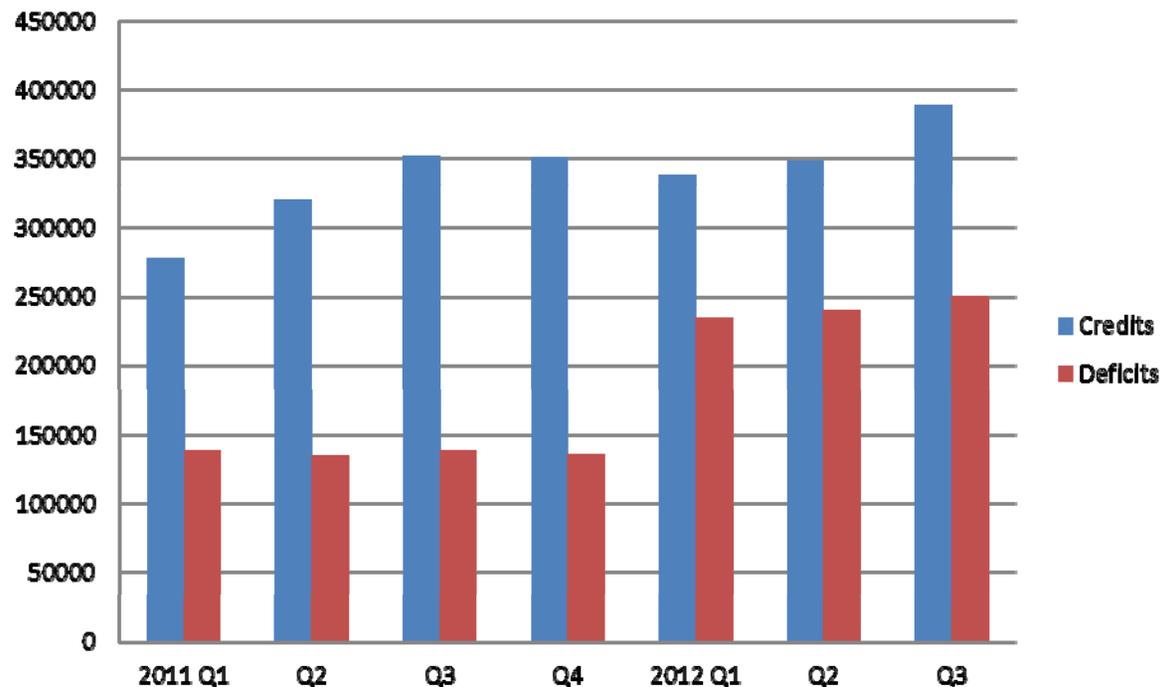
Carbon Intensities of Some Fuels

- Gasoline 99 gCO₂e/MJ
- Diesel 98 gCO₂e/MJ
- Corn Ethanol 73 - 121 gCO₂e/MJ
- Sugarcane Ethanol 58 – 73 gCO₂e/MJ
- Biodiesel 4 – 83 gCO₂e/MJ
- Methane -15 – 83 gCO₂e/MJ
- Electricity 35 – 46 gCO₂e/MJ

LCFS Working As Designed

- Approximately 80 fuel providers are reporting & complying
- Credits being accrued, tradable any time (1,100,000 “excess” credits)

**Fig. 1. Total Credits and Deficits
(All Fuels) Reported, Q1 2011 -- Q3 2012**



LCFS Credits

- Source of credits
 - 80% from low-CI ethanol
 - 10% from natural gas
 - 8% from biodiesel
 - 2% from renewable diesel
- Credit transactions
 - No LCFS credit transactions in 2011
 - 17 LCFS credit transactions through Q3 2012
 - Price range: \$10 - \$30/MT
 - Trade volumes: 100 – 33,000 credits/trade

Calculating Credits

Formula:

$$\text{Credits} = (\text{CI}_{\text{standard}} - \text{CI}_{\text{reported}}) \times E_{\text{displaced}} \times (1 \times 10^{-6})$$

For example, for biodiesel from UCO (cooking req'd) as a diesel substitute in 2013:

$$(97.05 - 15.84) \times 1 \text{ million gal} \times 126.13 \text{ MJ/gal} \times (1 \times 10^{-6}) = 10,243 \text{ MT CO}_2\text{e} = 10,243 \text{ credits}$$

Calculating Credits (con't)

Formula:

$$\text{Credits} = (\text{CI}_{\text{standard}} - \text{CI}_{\text{reported}}) \times E_{\text{displaced}} \times (1 \times 10^{-6})$$

Units:

$$\frac{\Delta \text{gCO}_2\text{e}}{\text{MJ}} \times \text{gal} \times \frac{\text{MJ}}{\text{gal}} \times \frac{1 \text{ MT}}{1 \times 10^6 \text{ g}}$$

= MT CO₂e = credit

Opting into LCFS

- 1) Provider of natural gas, biogas, electricity or hydrogen (already meet 2020 standards for gasoline and diesel)
- 2) Or, out-of-state producer who wants to be Regulated Party
- 3) Or, intermediate party between out-of-state producer and importer
- 4) Or, gas or electric utility when priority Regulated Party for these fuels chooses not to opt in

Opting into LCFS (con't)

- Register with ARB as a regulated party in the LCFS Reporting Tool (LRT)
- Provide the following information:
 - organization name
 - organization address
 - organization federal employer identification number
 - primary contact name
 - telephone number
 - email address
- In specified cases, provide proof that entity who otherwise would've been the regulated party chose not to opt in (e.g., intermediate parties, utilities in some situations)

Opting out of LCFS

- 90-day notice to ARB to opt-out
- Provide any outstanding quarterly progress report
- Eliminate all deficits, if applicable
- End-of-year and subsequent year, confirm in writing:
 - remains opted out
 - not sold, traded, or otherwise transacted any LCFS credits since opt-out date

Thank You

<http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>

