Alcohol Fuel Flexibility: Progress and Prospects

Tom MacDonald
California Energy Commission
Fifteenth International Symposium on Alcohol Fuels
San Diego, California
September 26-28, 2005
First FFV Demonstrated in California – Ford Escort 1986
Ethanol FFVs as part of California's Motor Vehicle Population

Numbers are Millions of Vehicles

Data from California Energy Commission/California Department of Motor Vehicles joint-agency database project – April 2005
Ownership of Ethanol FFVs in California
E85 vs Gasoline Pricing – Two Minnesota Examples
E85 > Gasoline Fuel Substitution Factor Avg. for 2005 FFV Models

= 1.34
California Methanol Program Experience: Importance of Accurate Consumer Advisories

MULTIPLY METHANOL FUEL PRICE BY 1.7 TO COMPARE WITH GASOLINE PRICE.

The energy content of methanol fuel is less than gasoline. Therefore, it takes about 1.7 gallons of methanol fuel to equal one gallon of gasoline.
Data from: American Lung Assoc. of Minnesota “E85 Price Forum” (user-reported survey of prices at retail E85 stations in MN and other states); * Sept. 1-12
Recent California Reformulated Gasoline Blendstock Prices

Notes: Ethanol railcar prices are from Platts, and are average prices for prompt Southern California shipments including 52 c/gal federal tax credit (51 c/gal after 1/1/05). California alkylate prices are calculated from Platts and include 20 c/gal transportation & distribution cost from Gulf Coast to California. Spot wholesale prices for regular-grade California reformulated gasoline blendstock for oxygenate blending (CARBOB) are from US Department of Energy. Data from 11/3/03 to 9/1/05.

CEC/FO, Sept 2, 2005
Example of California Emission Certification
2005 Mercedes-Benz C240

The exhaust and evaporative emission standards (STD) and certification emission levels (CERT) for the listed vehicles are as follows (compliance with the 50 "testing requirement for TLEV, LEV, ULEV, SULEV) may have been met based on the manufacturer's submitted compliance plan in lieu of testing). Any data in the manufacturer's "NMOG Fleet Average" (PC and LD) or "Vehicle Emission Credit" (MOV) calculations is calculated as required. (For hi- or medium-duty rated vehicles, the NMOG and CERT in parenthesis are those applicable to testing on gasoline test fuel.)

Oxides of Nitrogen

Non-Methane Organic Gases

BE IT FURTHER RESOLVED: That the listed vehicle models, the manufacturer has attested to compliance with Title 13, California Code of Regulations, (13 CCR) Sections 1965 emission control laws. 1968.2 (on-board diagnostic, full or partial compliance), 2030 (emission control warranty), 2235 (bacterial fill pipes and openings, gasoline and alcohol fueled vehicles only), and "High-Altitude Requirements" and "Inspection and Maintenance Emission Standards" (California Exhaust Emission Standards and Test Procedures for 2001) and Subsequent Model PC. (TLEV and MLEV)

BE IT FURTHER RESOLVED: That the listed vehicle models are federally certified, and are certified under the provisions of 13 CCR Section 961(a)(14) and the incorporated test procedures.

Vehicles certified under this Executive Order shall conform to all applicable California emission regulations. The Bureau of Automotive Repair will be notified by any of this Executive Order.

Executed at El Monte, California on this ___ day of March 2004.

[Signature]
Mike Lyne, Chief
Mobile Source Operations Division
Brazil -- FFV Market Share in Light Vehicles Sales

January 2003 to May 2005

Source: Brazilian Automotive Industry Association - ANFAVEA
Ethanol vs. Gasoline Pricing in Brazil

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<td>Average</td>
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Avg. gasoline price is 1.66 x Avg. ethanol price

(Note: 1 Brazilian Real = 0.43 U.S. dollar)

Source of data: J Kingsman Ethanol; photo from Brazilian Automotive Industry Association - ANFAVEA
California Energy Commission Recommendations for E85


Establish a process to expand the use of E-85 in California by:

1) developing and certifying E-85-compatible fuel dispensing systems
2) implementing a process to expedite the permitting of E-85 stations
3) investigating the feasibility of requiring all or a portion of new cars sold in California to be FFVs
4) establishing a collaborative state/industry working group to identify fuel infrastructure changes needed to increase production and distribution of E-85 and prepare a strategic/business plan to exploit opportunities to incorporate E-85 into the existing retail fueling system
5) sponsoring a consumer notification and education program promoting the availability of FFVs and E-85 fuel
6) evaluating incentive programs in other states to determine their applicability and usefulness for creating an E-85 retail infrastructure in California
7) supporting research for the development of technologies to convert biomass resources to ethanol

* Full report on Energy Commission website at: