

Opportunities for E85 in California

**California Air Resources Board
Meeting on Vapor Recovery for E85 Facilities
February 2, 2006**

**Gary Herwick
Transportation Fuels Consulting
On behalf of
National Ethanol Vehicle Coalition**

National Ethanol Vehicle Coalition

- **Primary national advocate for E85 and flexible fuel vehicles.**
- **The NEVC Board of Directors includes the National Corn Growers Association, state corn grower groups, the Governors' Ethanol Coalition, Verasun Energy, Clean Fuel USA, ethanol producer groups, General Motors and Ford.**
- **To date, the NEVC has 364 members including corporate, individual and associate.**
- **Policy accomplishments include new federal infrastructure tax credit, fuel purchase for federal alternative fuel fleets and flexible fuel vehicle labeling.**
- **There are currently 585 public E85 fueling facilities across the United States. In 2005, the NEVC assisted in establishing 323 of these sites.**

California Objectives

- **Non-petroleum fuel use: 20/30% in 2020/2030**
 - Energy Commission 2005 Integrated Energy Policy Report to the Governor
 - Calls for simultaneous emission and GHG reduction
 - Long term transport plan to Governor by March 31, 2006 including alternative fuel use
 - AB 1007 “Pavley” requires plan by June 2007
 - Ethanol and E85 are likely to be a major part of that plan
- **GHG reductions: 17/27% in 2020/2030 in the vehicle fleet, 22/27% in 2012/2016 in new vehicles**
 - AB 1493
 - Auto industry lawsuit
 - Currently not clear how much of a role E85 could play

Integrated Energy Policy Report

Recommended Strategies

- **“...move toward more sustainable technologies and fuel types, and build the necessary infrastructure to protect California from future supply disruptions and high prices.”**
- **Increase the use of non-petroleum fuels to 20% by 2020, 30% by 2030**
- **“The state should simultaneously reduce petroleum fuel use, increase fuel diversity and security, and reduce emissions of air pollution and greenhouse gases.”**
- **“The state should establish a state renewable gasoline fuel standard so that the pool of all gasoline sold in California contains, on average, a minimum of 10 percent renewable content.”**
- **“The state should, for its fleet of vehicles, establish ...a procurement requirement for alternative fuels and vehicles.....”**
- **“The Energy Commission should develop petroleum infrastructure permitting guidelines based upon a “best practices” approach following this inter-agency evaluation.”**
- **Greenhouse gas emission reduction strategies are a priority.**

E85 and Flex Fuel Vehicles

- **Ethanol has the potential to address reductions in petroleum fuel use and GHG's proposed in California in the near term. E85 and FFVs maximize the use of ethanol.**
- **Based on technical assessment, permeation evaporative emissions may not be an issue with E85**
 - **CRC "E-65" research due to provide data by December 2005**
- **20% GHG reduction with E85 from corn, 60-65% GHG reduction with cellulose E85***
- **Research suggests that 25-30% of the US fuel pool could be replaced by ethanol****
- **Currently about 300,000 FFVs estimated in the California in-use fleet, growing at the rate of 50,000 per year.**
- **E85 can be cost competitive to gasoline at \$2.20 per gallon on an energy equivalent basis without subsidies for ethanol.**
- **Alternative Fuel Infrastructure Tax Credit expected to allow credit for 30% of new I/S investment up to \$30,000.**

* "An Update of Energy and Greenhouse Gas Emission Impacts of Fuel Ethanol", Michael Wang, Argonne National Laboratory, February 2005.

** GM/University of Toronto research on cellulose ethanol supply

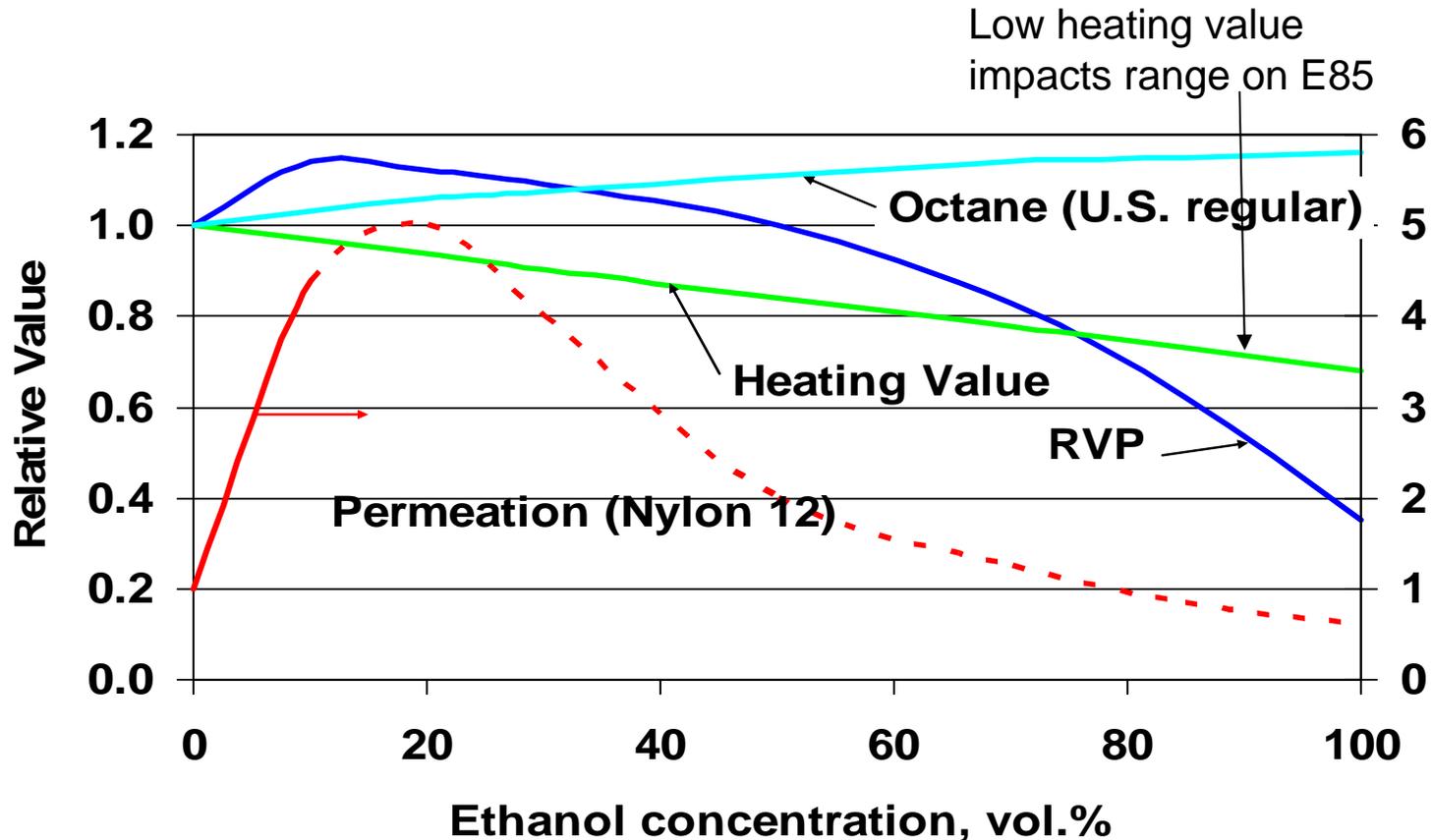
Expansion of E85 and FFVs in California

- **Investment in E85 infrastructure has been discouraged by regulatory requirements**
 - New processes are likely to encourage development of “novel” facilities
 - A long term plan is needed to support widespread infrastructure
 - New federal infrastructure tax credit will encourage investment in new stations
- **Supply/availability of ethanol**
 - 4.7B gal of ethanol would be needed annually to supply 20% of California’s transportation fuel consumption
 - Production of ethanol from cellulose would be needed to address GHG reduction targets
- **Current wholesale fuel prices will require incentives to permit attractive retail pricing approaching energy equivalence**
- **Continued incentives are needed to insure availability of FFVs**
- **Future California emission requirements are likely to limit the availability of E85 FFVs beyond 2007 as PZEVs are sold to meet the ZEV mandate**

Ethanol Issues

- **Evap emission impact of E5.7 & E10 requires mitigating strategies**
- **Tailpipe NOx emissions impact of E5.7 & E10 requires mitigating strategies**
- **Oil industry concerns – API/AIR report on inventory impact**
- **Opposition to ethanol by select environmental groups – national ALA, Sierra Club**
- **Energy Balance - Prof. Patzek at UC Berkley, Pimentel formerly of Cornell Univ.**
- **Sen. Feinstein opposition to RFS – June 15, 2005 letter to Congressional colleagues - high cost, energy balance, ozone impact of E10**
- **Sulfates and peroxides formation**
 - **Fuel pump wear, fuel injector sticking**

Typical Ethanol Impacts on Fuel Properties



Permeation results are illustrative, depend on polymeric material

- **E85 represents perhaps the best opportunity to address California goals of reducing petroleum fuel use and greenhouse gas emissions.**
- **Several barriers must be addressed including infrastructure development, increased ethanol supply, FFV availability and pricing.**
- **More streamlined certification of a limited number of new “novel” E85 dispensing facilities should help to encourage equipment manufacturers, and identify issues to further infrastructure expansion.**
- **The National Ethanol Vehicle Coalition has played a key role in obtaining incentives and establishing new E85 infrastructure.**
- **NEVC is prepared to participate in the California process and offer assistance and resources**