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AB 868
Fuel Delivery Temperature Study

Staff Workshop
California Energy Commission

Sacramento, CA
January 24,2008

Gordon Schremp
Fuels and Transportation Division
California Energy Commission

Taking notes is optional since an electronic copy of this presentation will be posted on our web site, along with an audio recording

Presentation Topics

- Goal of workshop
- Overview
- Proposed structure of study
- Consumer impacts
- Business impacts
- Agency impacts
- Other issues
- Next steps
- Additional questions and resources

Goal of Today's Workshop

- We recognize that automatic temperature compensation or correction elicits strong viewpoints, as such we will strive to maintain our commitment to producing a thorough and objective assessment of this issue in as transparent a manner as possible
- Goal is to obtain feedback from stakeholders regarding:
  - Advisory Group representation
  - Panel format
  - Proposed structure of the cost-benefit study
  - Consumer impacts methodology
  - Business impacts calculation
  - Agency impacts assessment
  - Identification of additional informational resources

Temperature Compensation Fuel Distribution Chain

Refiners

Refiners' Terminals

Distributors/Jobbers

Retail Station

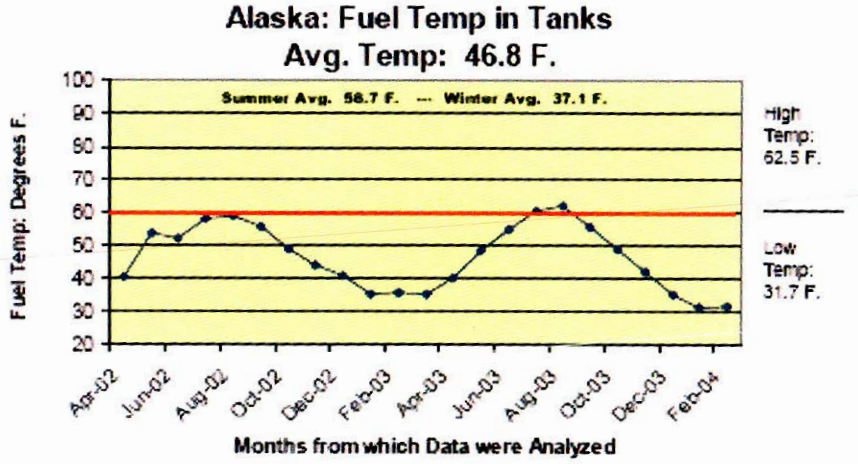
Consumers

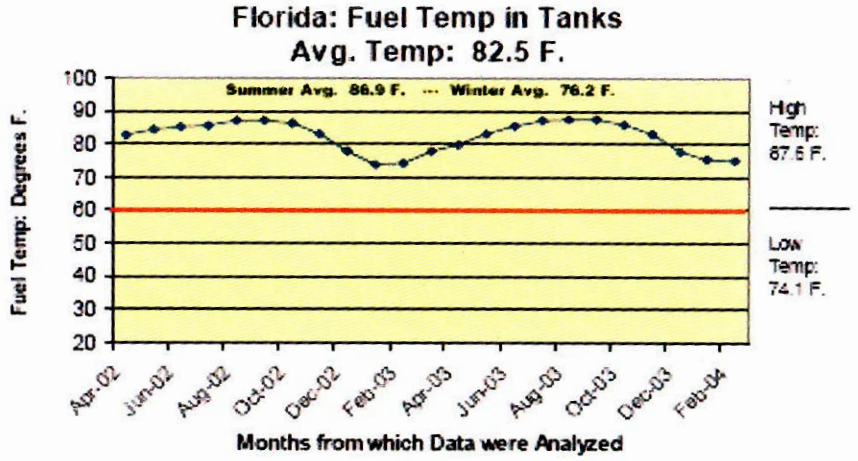
Temperature Adjusted

Temperature NOT Adjusted

Overview - Background

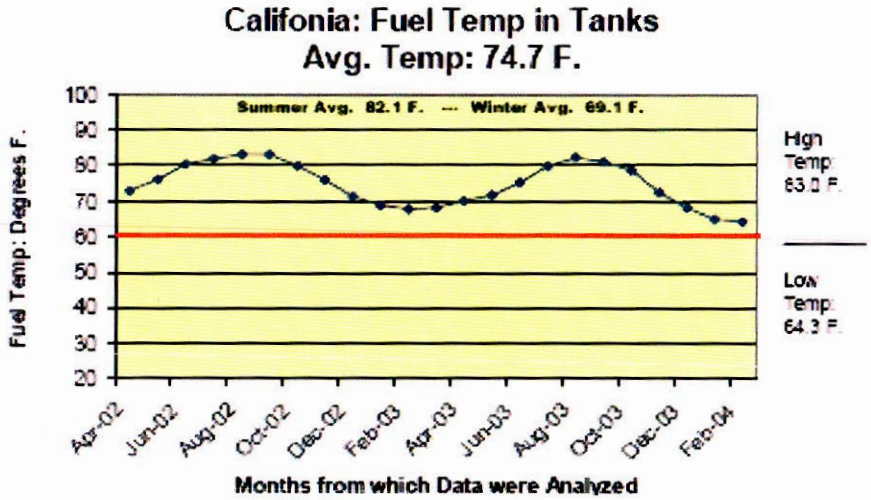
- Liquids expand and contract in response to changes in temperature
- Petroleum industry uses a reference temperature of 60°F
- Temperature of gasoline and diesel fuel delivered to retail establishments varies by geographic location and season according to an NIST study
- There are "cold" & "hot" states
- Temperature of retail fuel does not vary significantly prior to delivery to end consumer

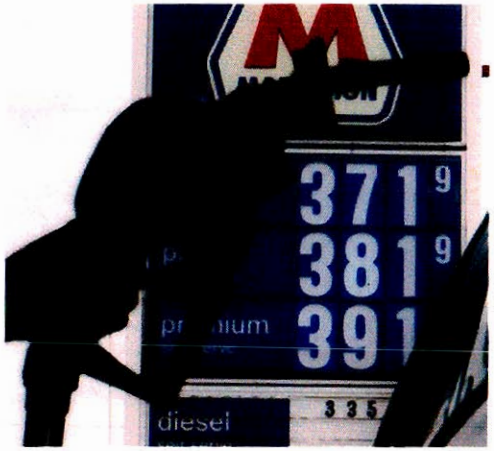




Overview - Background

- California appears to be one of the "hot" fuel states
- Gasoline that is 15°F warmer than the standard of 60°F is estimated to expand, resulting in 1 percent less energy
- ***For example***, would equate to about 160 million gallons of gasoline in California during 2006 or $480 million @ $3 per gallon, assuming average temperature was 75°F





Overview - AB 868 Legislation

- September 10, 2007– Calif. legislature approves AB 868
- September 18, 2007 – Bill enrolled to Governor's Office
- October 10, 2007 – Governor signs legislation
- Bill directs the Energy Commission to conduct cost benefit analysis for installation of Automatic Temperature Compensation (ATC) devices at retail establishments or establishing a new reference temperature
- The Energy Commission will work in partnership with Division of Measurement Standards, California Air Resources Board & industry
- Must convene an Advisory Group prior to January 25, 2008
- Study must be completed by the end of 2008
- Will include recommendations to the Legislature

Overview - Advisory Group

- Purpose of the Advisory Group (AG) is to convene stakeholders who have expertise in a number of areas associated with the fuel delivery temperature study
- Legislation lists specific groups of stakeholders
  - Equipment manufacturers
  - Consumer groups
  - Fuel industry representatives
  - Agricultural commissioners
  - Appropriate government agencies
  - Other interested parties
- Several potential AG stakeholders have been identified
  - ☑ Indicates that the organization has agreed to participate

Overview - Advisory Group

- Fuel dispenser manufacturers
  - Gilbarco
  - ☑ Veeder Root
  - ☑ Dresser Wayne
  - Tokheim
  - Bennett Pump Company
- Retrofit contractors
  - ☑ Kraus Global
  - MeterCal

GILBARCO VEEDER-ROOT

TOKHEIM QUALITY

DRESSER Wayne

Bennett simply better

Kraus GLOBAL Transportation Refueling Systems

METERCAL ELECTRONIC PROVING TECHNOLOGY

Overview - Advisory Group

- Consumer
  - ☑ Foundation for Taxpayer and Consumer Rights (FTCR)
  - ☑ Northern California Automobile Association of America (NCAAA)
- Environmental
  - Natural Resources Defense Council (NRDC)
- Trucking
  - ☑ American Trucking Associations (ATA)
  - ☑ California Trucking Association (CTA)
  - ☑ Owner Operator Independent Driver Association, Inc. (OOIDA)
- Water associations
  - American Water Works Association (AWWA)
  - Association of California Water Agencies (ACWA)

Overview - Advisory Group

- California state agencies
  - ☑ CA Air Resources Board (CARB)
  - – CA Department of Food & Agriculture
  - – CA State Water Resources Control Board (SWRCB)
  - ☑ CA Division of Measurement Standards (DMS)
- Other state agencies
  - ☑ Arizona Department of Weights & Measures
  - – Hawaii Weights and Measurements
- Government agencies
  - – Government Accountability Office (GAO)
  - – National Institute of Standards and Technology (NIST)
  - – Measurement Canada

Overview - Advisory Group

- Petroleum industry
  - American Petroleum Institute (API)
  - Western States Petroleum Association (WSPA)
  - Individual oil companies
  - Big box stores (Costco)
- Retail affiliation
  - ☑ California Independent Oil Marketers Association (CIOMA)
  - National Association of Convenience Stores (NACS)
  - ☑ National Association of Truck Stop Operators (NATSO)
  - Petroleum Marketers Association of America (PMAA)
  - ☑ Society of Independent Gasoline Marketers (SIGMA)
  - Western Petroleum Marketers Association (WPMA)

Overview - Advisory Group

- County sealers
  - ☑ Large urban - **Los Angeles**, San Diego
  - ☑ Close to home - Sacramento
  - – Rural regions – Del Norte, Imperial
- Measurement organizations
  - – California Agricultural Commissioners and Sealers Association (CACASA)
  - – National Conference on Weights & Measures (NCWM)
  - – Western Weights & Measures Association (WWMA)
  - – Southern Weights & Measures Association (SWMA)

Overview – Future Workshops - 2008

- Will conduct a minimum of three additional public meetings, held at the Energy Commission in Sacramento
- **March 4th** – Advisory Group panel public workshop
  - Discussion of any revisions to scope of study
  - Receive updates on various aspects of study
- **June 5th** – Advisory Group panel public workshop
- **September 9th** – Committee workshop
  - Share preliminary findings in the form of a draft report
  - Receive stakeholder comments

Energy Commission Website

- The Energy Commission has created a website that will be used to provide information resources and status of the Fuel Delivery Temperature Study
- Link is as follows:

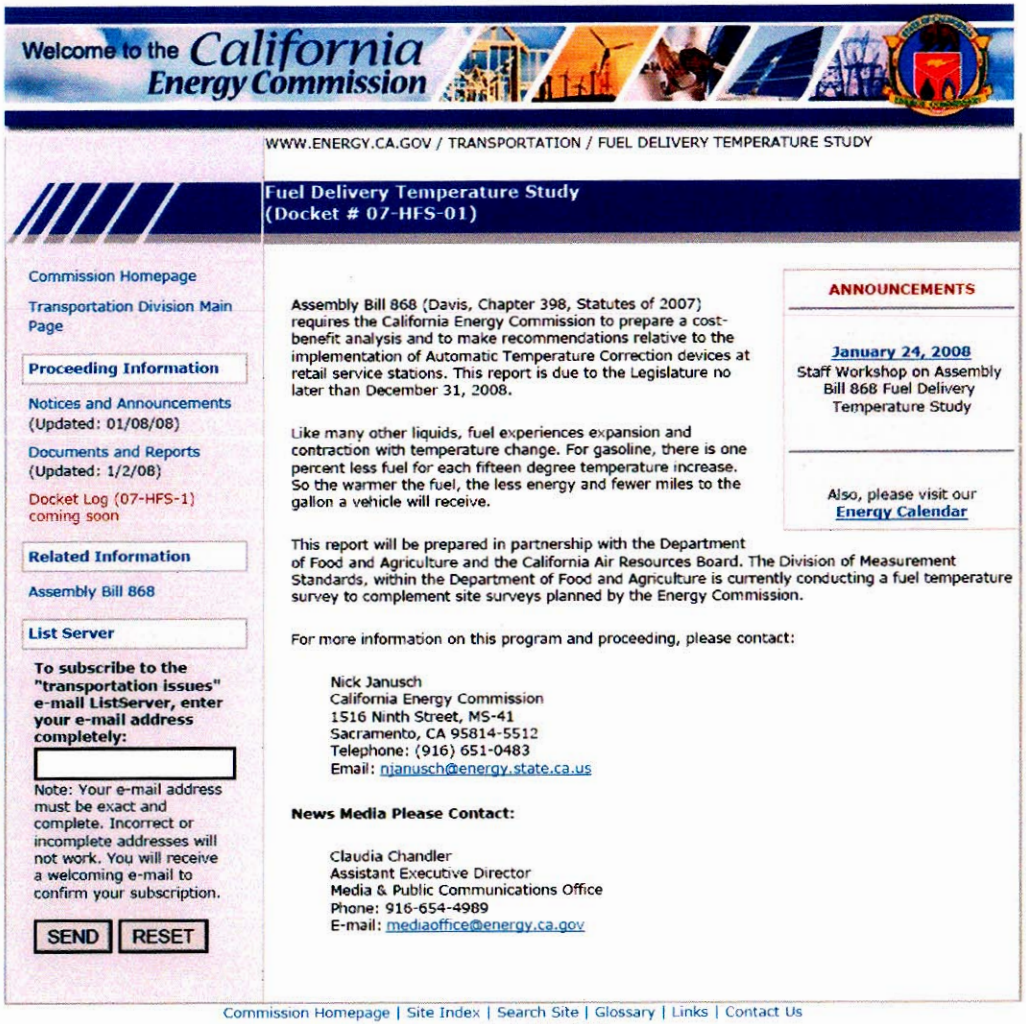
http://www.energy.ca.gov/transportation/fuel_delivery_temperature_study/index.html

- Interested parties may sign up on the list server or provide email address to staff in order to receive notices for future workshops & study documents

Overview – Workshop & Study Comments

- The Energy Commission encourages all interested parties to provide comments and feedback to technical staff throughout the course of this study
- Comments may be conveyed through various means:
  - Verbal
  - Written
  - Electronic
    - Documents
    - Email correspondence

Overview – Additional Q&A



Welcome to the California Energy Commission

WWW.ENERGY.CA.GOV / TRANSPORTATION / FUEL DELIVERY TEMPERATURE STUDY

Fuel Delivery Temperature Study
(Docket # 07-HFS-01)

Commission Homepage

Transportation Division Main Page

Proceeding Information

Notices and Announcements (Updated: 01/08/08)

Documents and Reports (Updated: 1/2/08)

Docket Log (07-HFS-1) coming soon

Related Information

Assembly Bill 868

List Server

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Note: Your e-mail address must be exact and complete. Incorrect or incomplete addresses will not work. You will receive a welcoming e-mail to confirm your subscription.

SEND RESET

Assembly Bill 868 (Davis, Chapter 398, Statutes of 2007) requires the California Energy Commission to prepare a cost-benefit analysis and to make recommendations relative to the implementation of Automatic Temperature Correction devices at retail service stations. This report is due to the Legislature no later than December 31, 2008.

Like many other liquids, fuel experiences expansion and contraction with temperature change. For gasoline, there is one percent less fuel for each fifteen degree temperature increase. So the warmer the fuel, the less energy and fewer miles to the gallon a vehicle will receive.

ANNOUNCEMENTS

January 24, 2008
Staff Workshop on Assembly Bill 868 Fuel Delivery Temperature Study

Also, please visit our **Energy Calendar**

This report will be prepared in partnership with the Department of Food and Agriculture and the California Air Resources Board. The Division of Measurement Standards, within the Department of Food and Agriculture is currently conducting a fuel temperature survey to complement site surveys planned by the Energy Commission.

For more information on this program and proceeding, please contact:

Nick Janusch
California Energy Commission
1516 Ninth Street, MS-41
Sacramento, CA 95814-5512
Telephone: (916) 651-0483
Email: njanusch@energy.state.ca.us

News Media Please Contact:

Claudia Chandler
Assistant Executive Director
Media & Public Communications Office
Phone: 916-654-4989
E-mail: mediaoffice@energy.ca.gov

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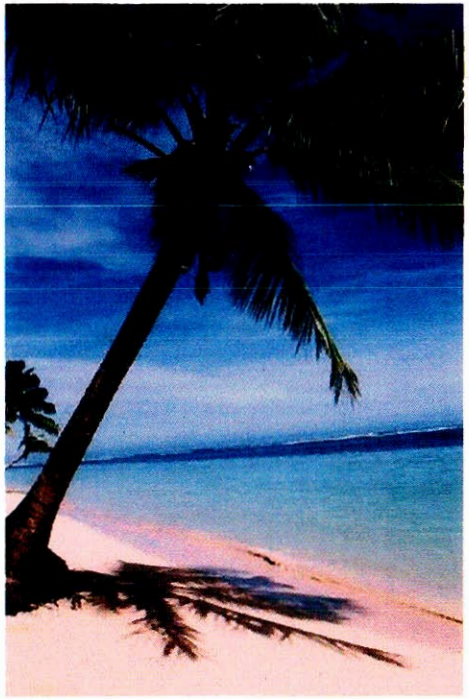
AB 868 – Proposed Study Structure

- Cost benefit analysis will examine the following ***options***:
  - Retain the current temperature reference of 60°F – do nothing
  - Establish a different statewide reference standard – Hawaii example
  - Establish different regional reference standards throughout the state
  - Installation of ATC retrofit kits at all retail establishments
    - Mandatory or voluntary
  - Installation of ATC retrofit kits at retail establishments ***on a regional basis***

Study Structure – Reference Temperature Adjustment Option

- The Energy Commission will examine the option of using a different temperature reference standard for the State for both gasoline and diesel fuel
- Hawaii adopted this approach in 1974
  - Act 239
  - Revised statute 486-50
- Gallon of retail gasoline dispensed in Hawaii contains 233.8 cubic inches, rather than 231 cubic inches
  - Adjusted to reflect an average temperature of 80°F
- Gallon of retail diesel fuel dispensed in Hawaii contains 233.3 cubic inches



Study Structure – Reference Temperature Adjustment Option

- The Missouri House of Representatives is considering legislation (HB 105) that would require volume adjustment
  - Would partition the state into 10 districts
  - Actual volume of fuel dispensed in each gallon would be adjusted based on the historical average *ambient* temperature of each district
  - For warmer regions, the size of the gallon would be increased to a quantity greater than 231 cubic inches
  - For cooler regions, the size of the gallon would be decreased to a quantity less than 231 cubic inches
  - Public hearing on bill was completed March 3, 2007

Study Structure – Reference Temperature Adjustment Option

- Anticipated costs of this option for use in California would need to be quantified and would include:
  - Recalibration costs for each fuel meter
  - Increased workload for state inspectors to verify compliance with new calibration standard
  - Increased equipment costs for state inspectors

Study Structure – ATC Retrofit

- The Energy Commission will examine the option of installing automatic temperature compensation devices at all retail establishments in the State – mandated & voluntary
- Canada adopted this approach on a voluntary basis in 1990
  - Approximately 90 to 95 percent of the fuel dispensed to the public is from fuel dispensers that have ATC devices
  - Retailers determined that the retrofit work was economical
  - ATC devices monitor the temperature of the fuel being dispensed and adjust the delivered volume to result in a liter of fuel that contains the same energy content as a liter at 15°C

Study Structure – ATC Retrofit

- Estimated benefits and costs of this option for use in California would need to be quantified and would include:
  - Estimated consumer benefits
    - Value of temperature-adjusted fuel
  - Potential business impacts
    - ATC retrofit equipment & installation labor
    - Calibration of devices
  - Potential agency impacts
    - Test procedures
    - Calibration equipment & inspection workload

Study Structure – ATC Regional Retrofit

- The Energy Commission will examine the option of installing automatic temperature compensation devices at retail establishments *in warmer regions* of the State – mandated & voluntary
- Similar analysis of the statewide ATC retrofit option, but would include a breakdown of California into different temperature zones
  - Based on the fuel temperature survey information obtained by the Division of Measurement Standards
- A cost-benefit analysis would then be performed for each of these individual temperature zones

Study Structure – Q & A

Consumer Impacts

- Retail consumer "savings" will be calculated using:
  - Regional fuel temperature data from DMS study – up to 36 counties
  - Statewide gasoline demand data from BOE
  - County-specific gasoline consumption data from CalTrans
  - County-specific average retail fuel prices from the Oil Price Information Service (OPIS)
  - Density algorithm from ASTM
- Will also investigate potential benefit of early leak detection and prevention
  - Input from industry and SWRCB will be solicited

Consumer Impacts – Methodology

- Retail consumer "savings" will be calculated using:
  - Fuel volumes
  - Fuel prices
  - Fuel temperature
  - Fuel density
- Seasonality of gasoline density will also be addressed
  - One average density or seasonal densities?
- Analysis will be performed on a county-specific basis

Consumer Impacts – Fuel Volumes

- California motorists use about 16 billion gallons of gasoline and 4 billion gallons of diesel fuel each year
- The California State Board of Equalization reports statewide taxable gasoline sales on a monthly basis
- The California Department of Transportation estimates county-specific demand for both gasoline and diesel fuel
- The Energy Commission will use both of these sources to estimate monthly demand for each county for the period April 2007 through March 2008

Consumer Impacts – Fuel Prices

- The Energy Commission purchases retail gasoline and diesel fuel prices on a daily basis from OPIS
- Technical staff will use this data to calculate monthly average fuel prices by county
- All counties have monthly retail gasoline price representation
- Coverage for retail diesel fuel does not include all counties
- Estimates will need to be used for some counties based on proximity to other counties that have pricing data

Consumer Impacts – Fuel Temperatures

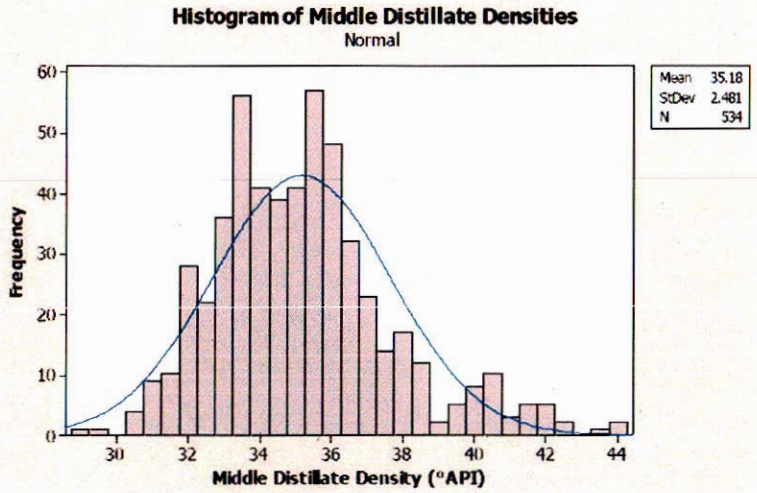
- The California Division of Measurement Standards (DMS) has been working with county sealers to obtain fuel temperature data at retail establishments since April 2007

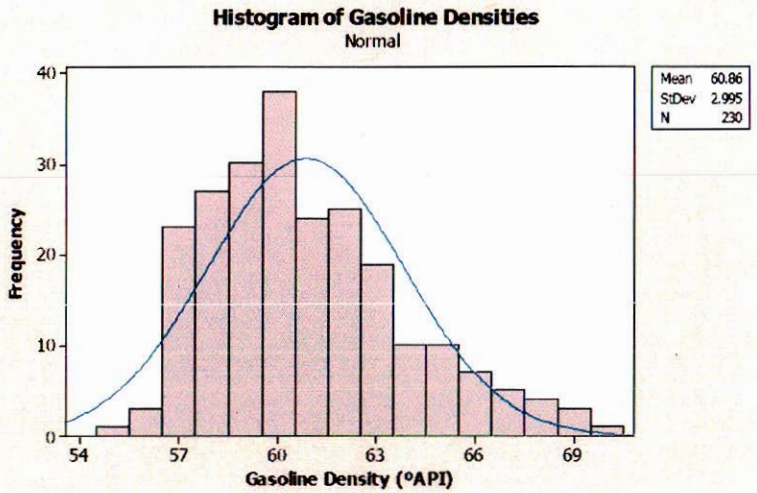
California Fuel Temperature Survey

- Temperature survey work will continue through March 2008

  http://www.cdfa.ca.gov/dms/fueltempsurvey/FuelTempReports.pdf
- DMS has already provided Energy Commission staff with preliminary data set
- Majority of counties have temperature data
- Energy Commission technical staff will use this information to develop county-specific monthly average temperature estimates

Consumer Impacts – Fuel Density

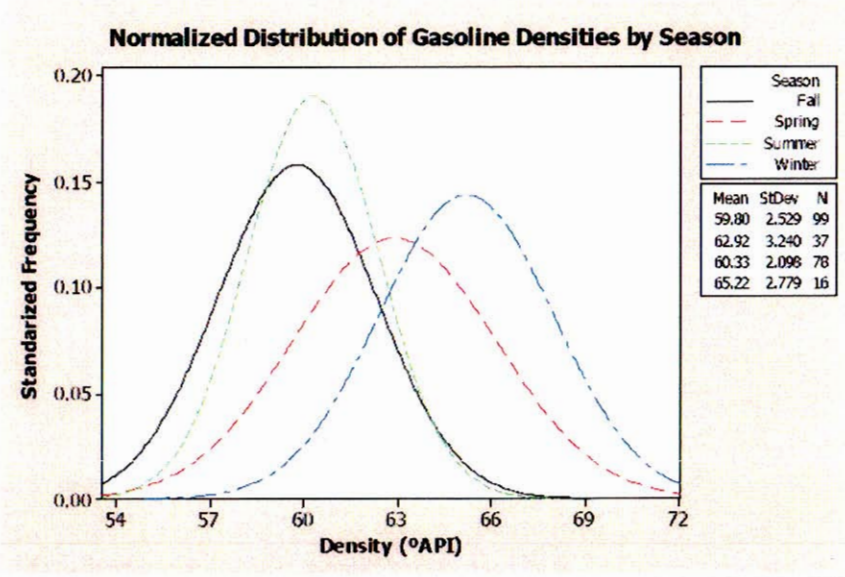




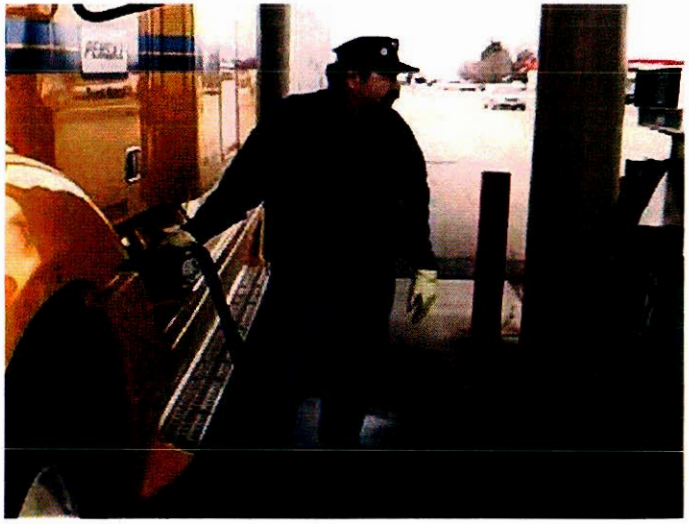
- In order to calculate how much gasoline expands or contracts relative to the 60°F reference temperature, you need to know the density of the fuel
- Gasoline and diesel fuel densities vary based on their fuel properties

Consumer Impacts – Fuel Density

- But gasoline density also varies seasonally
- The CARB will analyze retail station samples to calculate density distributions
- Energy Commission will work with CARB to determine density variations for gasoline based on seasonality and ethanol content



Consumer Impacts – Q & A



Business Impacts

- Business costs will be calculated using:
  - Fuel dispensers – make & model
  - ATC retrofit equipment costs @ expected lifetime
  - Installation labor costs & periodic maintenance
  - Incremental costs for ATC-capable new dispensers
- Analysis will be performed on a county-specific basis
- Gasoline and diesel fuel dispensers will be included in the assessment
  - Lack of data will likely preclude analysis for other types of transportation fuels, with possible exception of aviation gasoline

Business Impacts – Fuel Dispensers

- What information will be required to determine range of costs for ATC retrofit kit?.....good question!
  - Fuel dispensers
    - Dispenser manufacturer and model is optimal
    - Mechanical versus electronic
    - Quantity of fuel dispensers
    - Number of meters per dispenser
    - Number of gasoline grades/fuel types per dispenser

Business Impacts – Fuel Dispensers

- Unfortunately, not all relevant dispenser information is available from state agencies and petroleum companies
- A survey of California retail outlets will be necessary to obtain missing data
- County sealers have the most accurate list of locations
- The Energy Commission is currently working with the California Agricultural Commissioners and Sealers Association (CACASA) to enlist the assistance of California's county sealers to obtain fuel dispenser data critical to the study

Business Impacts – ATC Equipment

- Equipment costs to retrofit fuel dispensers with ATC can vary
- Expense of retrofitting mechanical fuel dispensers is generally more costly when compared to modern electronic dispensers
- The Energy Commission will be seeking the assistance of fuel dispenser manufacturers and retrofit companies to obtain retrofit kit costs by make of model of dispenser
- Will also seek input on expected reasonable use lifetime for retrofit kits based on experience from Canada

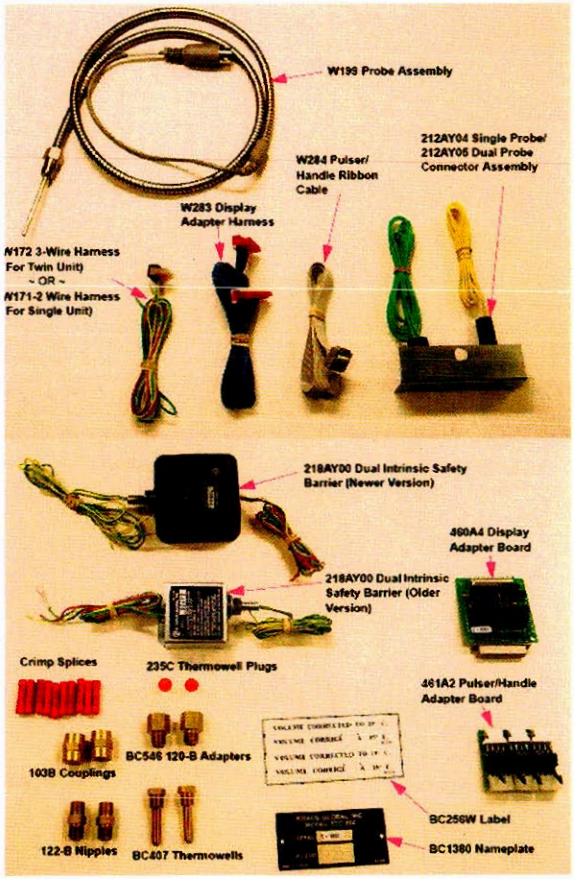
Business Impacts – Installation Costs

- But equipment costs are only one portion of the estimated expense of retrofitting a retail establishment with ATC equipment
- The cost of labor to install the retrofit will also be included in the analysis
- Installation costs vary, but are usually greater for mechanical dispensers and will normally increase with the number of fuel types per dispenser
- Based on the useful lifetime analysis, it may be reasonable to include the cost for periodic maintenance as well

Business Impacts – ATC Dispensers

- If ATC retrofit is determined to be one of the more cost-effective solutions, the Energy Commission will want to calculate the incremental costs to fuel dispenser manufacturers to produce ATC-capable dispensers
- It is assumed that the incremental costs to produce these types of dispensers would be less than the cost to retrofit existing ones, but how much less is not known
- This information would be relevant in determining future business costs for new retail establishments

Business Impacts – Q & A



Agency Impacts

- Agency impacts will be calculated using:
  - Calibration test procedure development
  - Calibration equipment
  - County sealer increased workload
- Analysis will be performed on a county-specific basis

Agency Impacts - Calibration

- If ATC retrofit is determined to be one of the more cost-effective solutions, the Energy Commission will want to identify additional costs that may be incurred by Division of Measurement Standards and the various County sealers
- Additional costs will include the cost of calibration equipment that will need to be purchased for use during field inspections of fuel dispensers
- In addition, DMS will need to develop inspection & testing procedures for ATC devices, procedural work that will likely increase their workload on a temporary basis

Agency Impacts - Inspection

- Among their many duties, California county sealers are responsible for inspecting and testing of retail fuel dispensers to ensure that the devices are operating within normal parameters
- The time to complete an inspection of a retail outlet can vary depending on the number of fuel dispensers
- It is anticipated that the average time to conduct these inspections will increase if ATC retrofit were required
- The Energy Commission is seeking assistance from the county sealers to help quantify the average duration of inspections & incremental time to verify correct calibration of ATC devices

Agency Impacts – Q & A

Other Issues

- The Energy Commission may also examine a number of other issues during the study, including but not limited to:
  - Disproportionate economic impacts
  - Potential funding sources
  - Timing
  - Labeling of fuel dispensers
  - Potential environmental benefits – early leak detection
  - Renewable fuels and the proposed Low Carbon Fuel Standard

Other Issues
Disproportionate Economic Impacts

- If ATC retrofit is recommended, it is possible that the cost could be prohibitive to smaller business owners
- Loss of retail establishments in areas of the state with fewer stations could disproportionately impact availability of fuel supplies
- Economic impact for retail establishment with lower average sales volumes per fuel dispenser could be greater

Other Issues
Potential Funding Sources

- If ATC retrofit or new reference temperatures are concluded to be cost-effective solutions, who could pay?
  - All businesses?
  - Oil companies?
  - All consumers?
- If additional costs are incurred for various state and local agencies, how could new equipment purchases and increased staffing requirements be funded?
  - General fund?
  - Fee on transportation fuels?
  - Increased fees for retail establishments?

Other Issues - Timing

- If ATC retrofit or new reference temperatures are concluded to be cost-effective solutions, how quickly could the new standards be put into place?
- Regulations would need to be developed if the Legislature takes action to require some form of ATC
  - DMS may need to develop test procedures
  - ATC retrofit kits may also need to be certified
- Modifications to retail establishments could take time
  - Equipment & installer availability?
  - Regional phase-in schedule?
  - All new retail establishments and station reworks?

Other Issues - Labeling

- If ATC retrofit or new reference temperatures are concluded to be cost-effective solutions, how could consumers be notified?
- One approach may be the requirement that labels be used to indicate the fuel dispensed has "had the volume adjusted for temperature"
- In fact, some station operators may already be using labels to notify their customers that the fuel volume is ***not*** adjusted for temperature
- Voluntary installation of ATC fuel dispensers may require appropriate labeling to help ensure consumers can make more informed purchasing decisions

Other Issues
Potential Environmental Benefits

- Based on the experience of fuel retailers in Canada, it has been noted that fuel throughput can be tracked with greater precision
- To what extent, if any, does this increased inventory monitoring accuracy improve the capability to detect low-level releases from underground storage tanks?
- Energy Commission technical staff will seek input from other stakeholders to verify the accuracy of these claims and to quantify a range of potential environmental benefits
  - Water agencies, Canadian inspectors & California county sealers

Other Issues
Renewable Fuels & LCFS

- AB 868 also requires that:

  "*The commission shall evaluate how different reference temperatures or temperature correction devices apply to alternative fuels and low-carbon fuel standards.*"
- Primary aspect of this portion of the analysis includes identifying the densities of different alternative fuels and their respective thermal expansion properties
- Average concentration of ethanol in California gasoline is expected to increase over time
- Assessment of potential LCFS impacts may not be feasible since regulatory development is ongoing

Other Issues – Q & A

Next Steps

- The Energy Commission will conduct the next public staff workshop for the Fuel Delivery Temperature Study on **March 4, 2008**
- A notice for this meeting will be emailed during mid-February
- Format of workshop will include the convening of panels structured by various topics
- Intent is to have Advisory Group members and technical staff of California agencies participate in the panel discussions
- Seeking "volunteers" to chair the panel discussions

Next Steps – Panel Structure

- Primary purpose of the panels is to provide updates on progress-to-date for specific portions of the study
- The structure is intended to serve as a forum for raising issues, providing relevant information, and achieving as much consensus as feasible
- Modification to the scope of the overall study is likely based on input from stakeholders and identification of new issues

Next Steps – Panel Structure

- Proposed panels to include but not be limited to the following:
  - Temperature study
  - Consumer impacts
  - Business impacts
  - Agency impacts & regulatory activities
  - Other issues
- Additional suggestions are welcome

Additional Questions & Resources

Contact Information

Gordon Schremp
gschremp@energy.state.ca.us

Nick Janusch
njanusch@energy.state.ca.us

Paul Deaver
pdeaver@energy.state.ca.us