



Hydrogen

California Department of Food and Agriculture
Division of Measurement Standards

Integrated Energy Policy Report Workshop
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Division Mission Statement

Preserve and defend the measurement standards essential in providing the citizens a basis of value comparison and fair competition in the marketplace



Authority

Authority to regulate Weights and Measures and Fuel Products is found in Division 5 of the California Business and Professions Code





Alternative Fuels

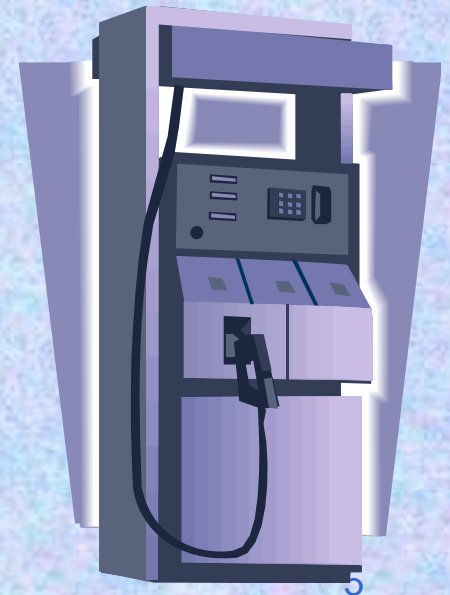
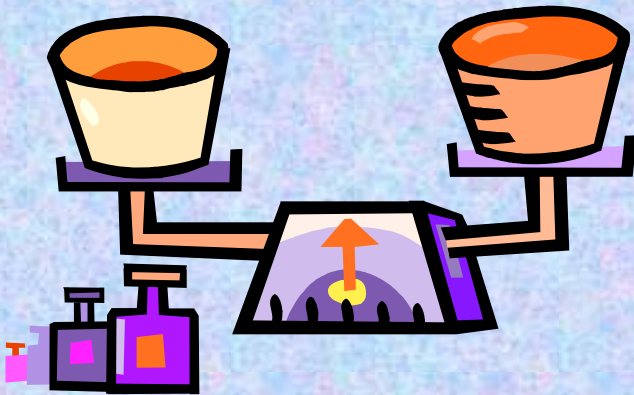
CDFA Responsibilities

- ❖ **Division of Measurement Standards (DMS) role in alternative fuel development**
 - ✓ **Ensure Measurement Traceability**
 - ✓ **Promote Uniform Requirements and Practices**
 - ✓ **Ensure Consumers Get What They Pay For**
 - ✓ **Level Playing Field in the Marketplace**
 - ✓ **Harmonize with International Standards**



Commercial Measuring Device

A device used for ascertaining the measure of any commodity or thing which is sold on the basis of measure; or the determination of the measure of any commodity or thing upon which determination a charge for service is based.





Alternative Fuels

Division Responsibilities

- **Type Evaluation**
 - National and California Type Evaluation Program
- **Device Accuracy**
 - CA Device Compliance Program
- **Fuel Quality, Advertising, Labeling, and Quantity**
 - CA Petroleum Products Program
- **State / County Relationship**



CA Petroleum Products Program

❖ National Standards Organizations Participation

- Establish uniform standards to enhance consumer protection
- Foster fair competition
- Facilitate economic growth and trade



Standards Organizations

❖ ASTM International, Inc.



❖ Society of Automotive Engineers



❖ National Institute of Standards and Technology



❖ International Organization for Standardization





Hydrogen





Hydrogen

California leads the nation in hydrogen fueling stations



❖ **National standards have yet to be developed for:**

- **fuel quality**
- **device specifications**
- **test methods**
- **sampling techniques**
- **method of sale**
- **unit of measure**



Hydrogen Device Issues

- ❖ **Metering of hydrogen is very complex**
 - ❑ **No approved commercial devices are available to date for reference standards**
 - ❑ **Existing data is proprietary**
 - ❑ **The Department will evaluate three potential reference standards and test procedures: gravimetric, volumetric, and master meter standards**



Test Methods

Gravimetric



Volumetric



Photos courtesy of NIST



Hydrogen Fuel Quality

- ❖ **Fuel cells require high quality hydrogen to provide maximum performance and prevent premature failures**
 - ❑ **As hydrogen quality is increased so does the cost of production and distribution**
 - ❑ **Hydrogen fuel must provide needed performance and be economically competitive to be a viable alternative fuel**





Hydrogen Fuel Quality Standards

❖ California is the first to establish hydrogen fuel quality standards

- ❑ National and international quality standards do not exist
- ❑ SAE, ASTM International and ISO are taking lead in development of specifications and test procedures
- ❑ The Department is participating in the process





Contact Information

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