

Shoreside Logistics for Natural Gas Fueling

Workshop on Alternative Fuels for Ferries and Other Vessels

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**Pacific Gas and
Electric Company**



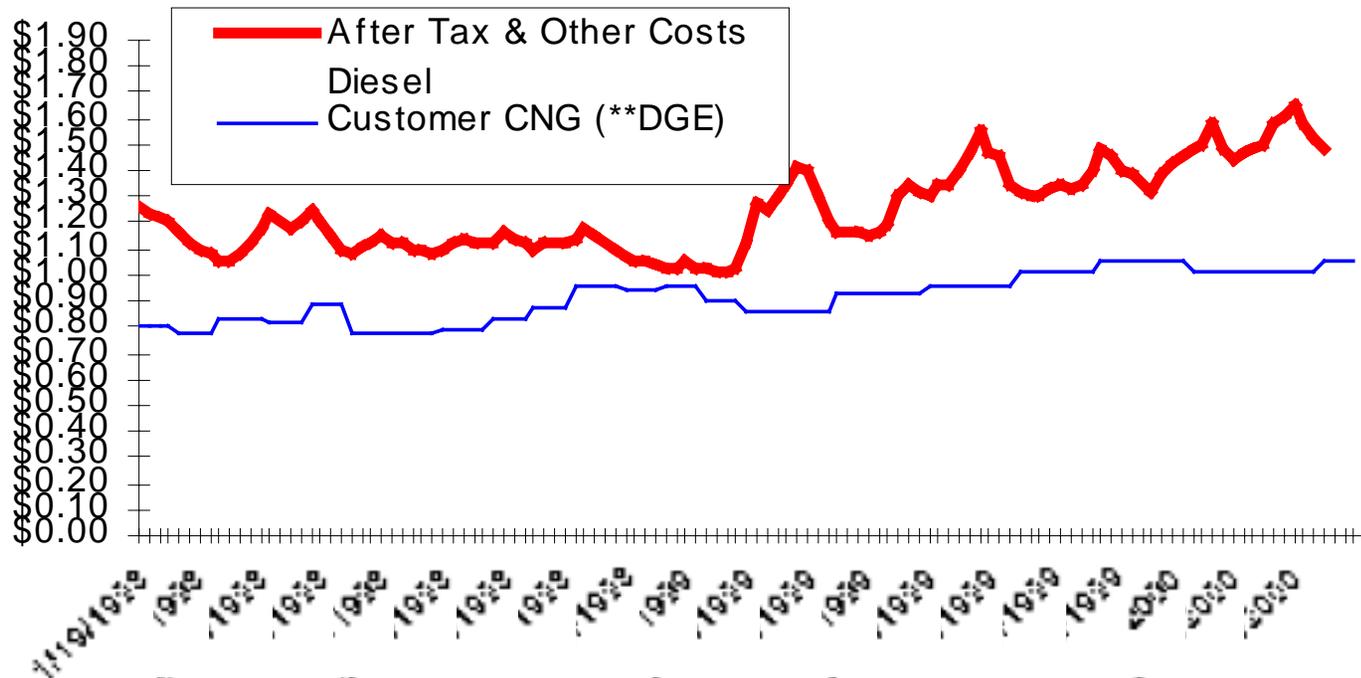
Natural Gas Pricing 101

- ◆ Natural Gas Cost Components
 - Commodity Costs
 - Transportation
 - ◆ CNG – Pipeline
 - Transmission
 - Distribution
 - ◆ LNG
 - Pipeline
 - Delivery
 - Other Costs



Natural Gas Price Comparisons

Weekly After Tax Wholesale Diesel and PG&E CNG Prices





Shoreside Natural Gas Safety

- ◆ Guidance Contained in:
 - NFPA 59A - production, storage, handling
 - NFPA 57 - LNG Vehicle fuel systems
 - NFPA 52 - CNG Vehicle fuel systems
 - National Electric Code (NEC)
 - Uniform Fire Code (UFC) for California
 - Coast Guard regulations



Shoreside NG Safety

- ◆ LNG facility
 - Storage vessel to be impounded
 - ◆ Impound equals full volume of storage
 - ◆ 15,000 to 30,000 gal tank = 50 ft from bldg
 - Methane detection
 - Fire Protection
 - Safety Plan/Emergency Procedure Manual/training
 - Emergency Shutdown System



Shoreside Natural Gas Safety

- ◆ Safety plan (LNG)
 - Detailed plan to cover potential conditions (minimum)
 - ◆ Shutdown or isolation of equipment
 - ◆ Use of fire protection facilities
 - ◆ Notification
 - ◆ First aid
 - ◆ Personnel duties



Shoreside Natural Gas Safety

- ◆ CNG facility
 - Compressor/storage/dispensing
 - Emergency Shutdown System
 - Fire Protection
 - ◆ Portable Extinguishers
 - 10 and 15 ft separation distances