



California Natural Gas Vehicle Coalition

West Coast Collaborative
Technology Panel

September 4, 2014



CA NGV Coalition 2014



California Market Overview

- “ Vehicles – 18 million globally, 150,000 in US.
~30,000 in California
 - ❧ Composition of US NGV fleet changing
 - ❧ Transit, Refuse, Drayage, Regional Delivery, Line-Haul
- “ California Infrastructure – 160 public access stations; >400 private stations
- “ LNG production – 1 in Southern California desert, 1 in Arizona. 1 in Development near Fresno

2020 Natural Gas Potential in CA

- “ 2012 California CNG/LNG usage
 - = ~160 million GGEs
- “ 2020 California CNG/LNG usage
 - Conservative = 900 million GGEs/year
 - Moderate = 1.2 billion GGE/year
 - Aggressive = 1.5 billion GGEs/year
- “ 10% will be biomethane (RNG)

Growing Selection of NGVs from OEMs, SVMs

HD Truck OEMs

- “ Freightliner Truck
- “ Volvo
- “ International
- “ Kenworth
- “ Peterbilt
- “ Mack

HD Vocational OEMs

- “ Mack
- “ Peterbilt
- “ Crane Carrier
- “ Autocar Truck
- “ ALF Condor
- “ Elgin
- “ Johnston
- “ Schwarze
- “ Tymco
- “ Capacity

HD Bus OEMs

- “ Thomas Built Bus
- “ Blue Bird Bus
- “ Optima/NABI
- “ El Dorado
- “ New Flyer
- “ Motor Coach Ind.
- “ Gillig
- “ DesignLine

HD Retrofit/Repowers

- “ American Power Group
- “ Clean Air Power
- “ Fyda Energy Solutions
- “ NGV Motori
- “ Omnitek Engineering

Dual fuel retrofits and SING repowers of Cummins, Daimler, Navistar, Detroit Diesel, Mack, Volvo, Caterpillar

LD OEMs

- “ American Honda
- “ General Motors
- “ Chrysler Ram Trucks

LD/MD Retrofits*

- “ Altech-Eco
- “ Landi Renzo/Baytech
- “ IMPCO Automotive
- “ Westport/BAF Technologies
- “ NGV Motori USA
- “ NatGasCar
- “ Auto Gas America
- “ Greenkraft
- “ PowerFuel Conversions

Retrofits of GM, Ford, Dodge, VW, Mazda, Mitsubishi, Workhorse, Isuzu, JAC, UtiliMaster, Freightliner Custom Chassis

Recent Heavy Duty NGV News

- “ Introduction of the Cummins–Westport 12L (ISX12–G) engine
- “ 2014 ACT Expo – 29 NGVs including 17 HD trucks on the exhibition floor
- “ Freightliner offering natural gas engines in “severe duty” trucks (12L)
- “ Ford now offering 8 commercial vehicle models with a gaseous prep option

What to look for next 2 years

- “ Commercial availability of Volvo’s 13L engine
- “ **Near Zero Emissions (0.02 Gr/BHP hr) Heavy Duty engine development project**
 - Funded by SCAQMD, CEC and SoCalGas
 - Cummins–Westport 8.9L and Cummins 15L
 - Commercial availability in the 2017–2019 timeframe
 - These engines expected to have diesel equivalent fuel econ

Next generation of tanks/cylinders

Infrastructure

- “ More than 80 companies building stations across the US
- “ CNG/LNG “traditional stations” plans
- “ Smaller scale “CNG/LNG in a box”
 - ☞ GE, Galileo, Shell
- “ Individual CNG pumps at existing petroleum station

Opportunities and Challenges

- “ NG fuel price advantage projected to continue until at least 2020
- “ Most trucking companies operate on slim margins and are slow to embrace new technologies and fuels
 - Vehicle capital cost differential can be a barrier
- “ CEC providing significant NGV incentive support and new push for ARB incentive support
- “ Upstream methane emissions
- “ Renewable natural gas interchangeable with conventional natural gas – no blend wall

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