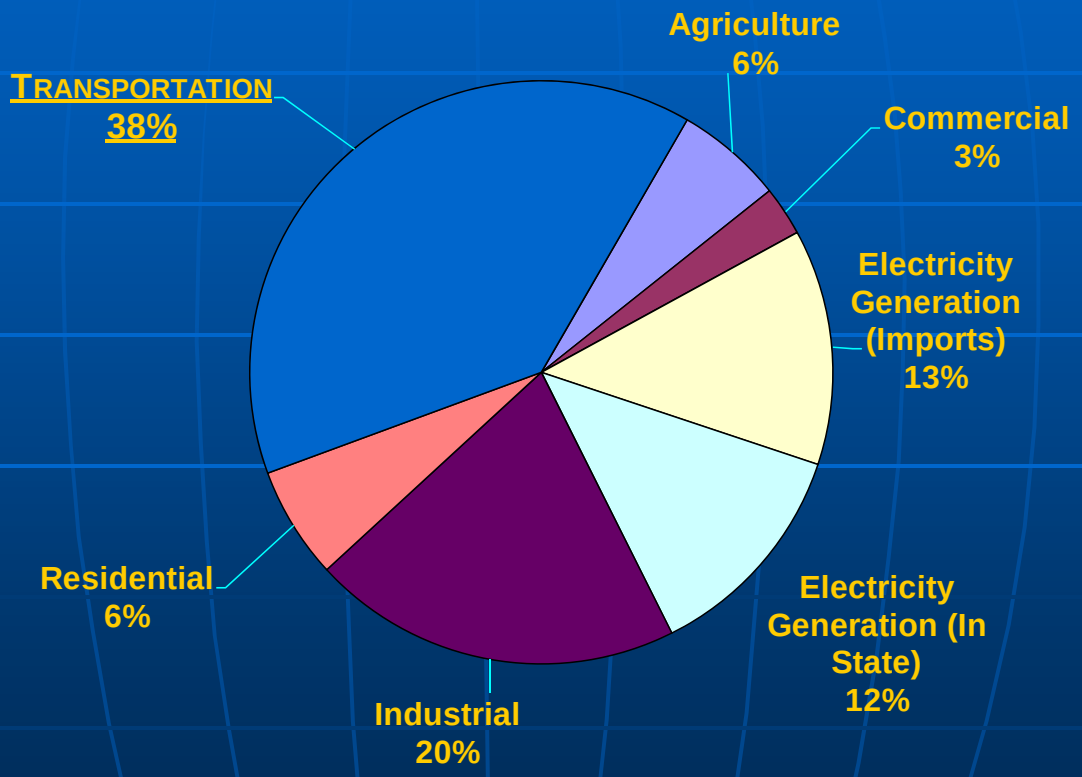
AB 118 Funding
Why Propane

For California Energy Commission

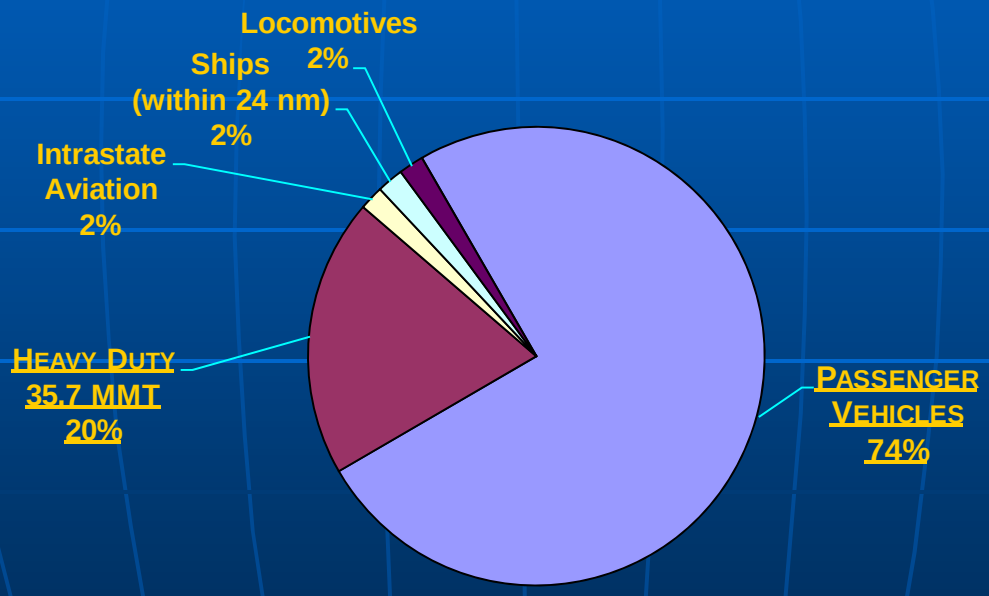
September 18, 2009

California GHG Emissions



Transportation GHG Emissions

(Statewide, almost 30% of GHG are from cars and light trucks, another 7% of the State's GHG are from trucks and construction equipment.)



Legislative Drivers – Four Legged Stool

- **AB 1493** Pavley (Vehicle CO_2 emissions)
- **AB 32** Nunez (and Pavley)
- **L**ow **C**arbon **F**uel **S**tandard (**LCFS**)
- **SB 375** Steinberg (requires the integration of regional planning with Regional Transportation Planning to reduce VMTs)

AB 1493 – Vehicle Technology

- Required CARB to establish cost-effective CO_2 emission standards for vehicles.
- Auto manufacturers have argued that a CO_2 emission standard is a defacto Mileage Standard.
- Like mandatory Air Bags, this is a “technology-driving” regulation

AB 1493 - *Translation*

By 2012 GHG emissions are to be reduced by 22%, and by 2016, GHGs reduced by 30% means:

- By 2012, sedans have to average 33 mpg; light trucks have to average 26 mpg.
- By 2016, sedans have to average 36 mpg; Light trucks have to average 28 mpg.

AB 1493 - Significance

By 2016, AB 1493 will reduce GHGs by 27.7 MMTCO2 – almost 16% of AB 32's (174 MMTCO2) 2020 target.

Low Carbon Fuel Standard (LCFS)

- On January 18, 2007, Governor Schwarzenegger issued *Executive Order* S-1-07 to enact a Low-Carbon Fuel Standard (*LCFS*).
- Fuels will change or be reformulated to produce fewer GHGs per Gallon

SB 375

- *"In order to reach California's greenhouse gas goals we must rethink how we design our communities."*

  (From Governor's Office Fact Sheet on SB 375)

LCFS & GASEOUS FUELS

CNG or Propane?

Do we ask Gas or Diesel?

Why not CNG *and* Propane?

LCFS & GASEOUS FUELS

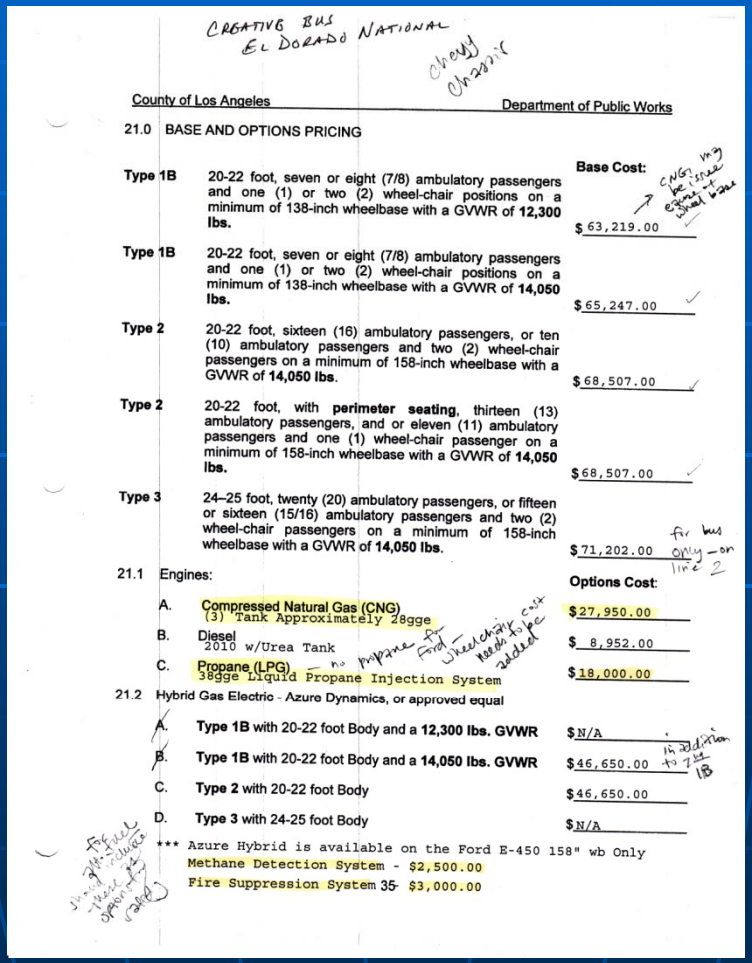
- Propane has a ***lower*** Carbon Value than CNG
- Through Class 5 (19,500 lbs. trucks) Propane conversions are much less costly than CNG conversions.
- Propane refueling infrastructure is far less costly.
- Propane requires few shop modifications.

Why Propane (LPG)?

- Propane is less expensive than gas diesel, and often, CNG.
- Propane's Price is more stable.
- Performance and Mileage of most efficient engines is comparable to Gas engines or CNG engines.
- Several CARB Certified engines have emissions that are comparable to CNG engines.

Typical Cutaway

Pricing for CNG vs Propane



CREATING BUS
EL DORADO NATIONAL
Chevy Chassis

County of Los Angeles — Department of Public Works

21.0 BASE AND OPTIONS PRICING

		Base Cost:
Type 1B	20-22 foot, seven or eight (7/8) ambulatory passengers and one (1) or two (2) wheel-chair positions on a minimum of 138-inch wheelbase with a GVWR of **12,300 lbs.**	$63,219.00
Type 1B	20-22 foot, seven or eight (7/8) ambulatory passengers and one (1) or two (2) wheel-chair positions on a minimum of 138-inch wheelbase with a GVWR of **14,050 lbs.**	$65,247.00
Type 2	20-22 foot, sixteen (16) ambulatory passengers, or ten (10) ambulatory passengers and two (2) wheel-chair passengers on a minimum of 158-inch wheelbase with a GVWR of **14,050 lbs.**	$68,507.00
Type 2	20-22 foot, with **perimeter seating**, thirteen (13) ambulatory passengers, and or eleven (11) ambulatory passengers and one (1) wheel-chair passenger on a minimum of 158-inch wheelbase with a GVWR of **14,050 lbs.**	$68,507.00
Type 3	24–25 foot, twenty (20) ambulatory passengers, or fifteen or sixteen (15/16) ambulatory passengers and two (2) wheel-chair passengers on a minimum of 158-inch wheelbase with a GVWR of **14,050 lbs.**	$71,202.00

21.1 Engines:

		Options Cost:
A.	Compressed Natural Gas (CNG) (3) Tank Approximately 28gge	$27,950.00
B.	Diesel 2010 w/Urea Tank	$ 8,952.00
C.	Propane (LPG) 38gge Liquid Propane Injection System	$18,000.00

21.2 Hybrid Gas Electric - Azure Dynamics, or approved equal

A.	**Type 1B** with 20-22 foot Body and a **12,300 lbs. GVWR**	$N/A
B.	**Type 1B** with 20-22 foot Body and a **14,050 lbs. GVWR**	$46,650.00
C.	**Type 2** with 20-22 foot Body	$46,650.00
D.	**Type 3** with 24-25 foot Body	$N/A

*** Azure Hybrid is available on the Ford E-450 158" wb Only

Methane Detection System - $2,500.00

Fire Suppression System 35- $3,000.00

Refueling Infrastructure

CNG

- Refueling capacity?
- Time to implement?
- Total Cost for fast fill?

Propane

(North Hollywood)

- 15,000 gal capacity
- 3 months start to finish
- Total Cost = $130,000

CNG

- CNG dispensers added to existing gasoline stations
- Combined CNG and LNG station (LCNG)

There are several hundred public and private CNG stations and approximately 30 LNG-dispensing facilities in California. Small, medium, and large CNG stations (compressors and dispensers) can be added to existing gasoline stations or built as "stand alone" CNG stations. It is also possible for a single station to dispense both CNG and LNG, and in fact LNG can be gasified to CNG with conventional pumps with less energy than it takes to compress pipeline gas to CNG, though CNG from LNG is more expensive than CNG from pipeline gas.

A network of 8-12 stations would be capable of handling the thousands of trucks involved in southern California's goods movement. On the heavy duty side, large stations will play by far the largest role. Smaller stations can be viable, but only if there is adequate vehicle throughput.

The natural gas fuel infrastructure is gradually expanding as a result of fleet rules in several California air basins, market-leader fleets, and the persistence of infrastructure developers. However, because natural gas infrastructure is relatively small in comparison to petroleum infrastructure, large amounts of capital are required to expand infrastructure. For the customer, the overall economics are favorable if the fuel cost savings can amortize the additional equipment costs. This equation favors high fuel use applications, and that is one reason why heavy duty vehicles are the fastest growing natural gas vehicle segment in California.

The table below presents Energy Commission estimates of current natural gas infrastructure costs.

Home Refueling Appliance	$ 4,750
Small Station[53]	$ 350,000
Medium Station[54]	$ 500,000
Large CNG Station[55]	$ 950,000
Large LNG Station[56]	$ 1,200,000
Add Public Fast Fill Dispenser	$ 125,000
Combined LCNG & LNG Station	$ 1,600,000

Current federal Alternative Fuel Infrastructure Tax Credit is 30 percent, not to exceed $30,000. Currently, a number of operating natural gas fueling stations are coming to the end of their useful life and will require retrofits or refurbishments to continue to provide fuel to local government, school district, and other natural gas fleets. To support the refurbishment or replacement of existing stations and the construction of new natural gas fueling facilities, the

[53] Defined as a capacity of less than 100 standard cubic feet per minute (scfm) From "Evaluation of Compressed Natural Gas (CNG) Fueling Systems", California Energy Commission, 1999.

[54] Defined as a capacity of 100 to 300 scfm. From "Evaluation of Compressed Natural Gas (CNG) Fueling Systems", California Energy Commission, 1999.

[55] Defined as a capacity greater than 300 scfm standard cubic feet per minute up to stations greater than 2000 scfm. From "Evaluation of Compressed Natural Gas (CNG) Fueling Systems", California Energy Commission, 1999.

[56] Ibid.

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Why the difference in proposed funding?

CNG

$43 Million in AB 118 Funding

Propane

$2 Million in AB 118 Funding

Sempra Energy's Energía Costa Azul LNG terminal

About 10% of the LNG comes off as very high grade Propane during re-gasification.

- Sempra owns San Diego Gas & Electric.
- Sempra owns the Gas Company.

Roush F-150

Sempra could fuel its service trucks *for free* using the propane from its LNG Terminal…

Choices & Decisions:

- Don’t Pick Winners and Losers –
- CNG for trucks and buses over 20,000 lbs.
- Under 20,000 lbs. “Let the MARKET DECIDE.”

PLEASE

- Distribute the funding more equitably between the gaseous fuels,

or

- Put the funding in a single pot for both gaseous fuels.

CNG *and* Propane

Thank You!

Rick Teebay
Los Angeles County