



Clean Energy[®]

North America's leader in clean transportation

Market Development for Natural Gas The New U.S. Transportation Fuel

Mitchell Pratt, SVP

January 7, 2009

Global NGV Strategy

U.S. NGV Strategy

Potential for NGV Market Growth

Global NGV Strategy

International NGV Growth

	August 2003	June 2008	Percent Increase
Global NGVs	2,814,438	8,600,000	300%
Global NGV Stations	6,455	13,000	200%

Market growth of 3 million vehicles 2007/2008

NGV global growth rate is increasing!

Notable NGV Growth

Country	NGVs 2003	NGVs 2008	Stations '03	Stations '08
Argentina	1,000,000	1,650,540	1,000	1,753
Pakistan	350,000	1,599,940	200	1,923
Brazil	550,000	1,511,945	535	1,609
India	137,000	821,872	116	325
Iran	*	815,000	*	347
Italy	400,000	500,000	490	609
Colombia	*	251,688	*	313
China	69,300	200,873	270	486
Global Total	2,814,438	8,600,000	6,455	13,000

Worldwide: 95% NGVs are Light-duty vehicle, 2% are Trucks, 3% are Buses

76% of New CNG Stations are Public

World Manufacturers of NGVs

GM/Opel	Chevrolet	Ford	Mercedes
Volkswagen	Fiat	Citroen	Hyundai
Renault	Peugeot	Tata	Mitsubishi
Toyota	Honda	Nissan	Isuzu
Skoda	Volvo	Geely	Lifan

GM alone makes 18 natural gas models worldwide
through their alliances with other OEMs

VW Passat



Opel
Zafira



Fiat Multipla

World NGV Products – Consumer Oriented



World NGV Products – Consumer Oriented



Austria – Sample of Aug 2008 NGV Offerings

Standard Factory Models	Retrofit Models
Citroen (3)	Audi (2)
Fiat (7)	Cadillac (4)
Ford (3)	Chevrolet (1)
Iveco (1)	Chrysler (2)
Mercedes (3)	Dodge (3)
Opel (3)	Fiat (2)
Peugeot (2)	Jeep (3)
Renault (1)	Mercedes (13)
Skoda (1)	Opel (9)
Volkswagen (4)	Saab (2)
<u>Total 28 Factory Models</u>	Smart (1)
	Toyota (1)
	Volkswagen (7)
	<u>Total 50 Retrofit Models</u>

U.S. NGV Strategy

U.S. Market Development

- Strategic focus on return to base, high fuel use fleet vehicles
 - Air quality benefits
 - Economic benefits
- Key market segments
 - Transit, Refuse, Airport (shuttles and taxis), Regional Trucking
- Allows **profitable, simultaneous** development of infrastructure and fleets
- Public access allows market expansion to collateral fleets

Compressed Natural Gas



Taxis



Government Vehicles



Airport Transit

Liquefied Natural Gas (LNG)



Regional Trucking



Public Transit



Refuse Hauling

Recent Market Development Drivers

- Petroleum reduction and Greenhouse Gases
 - Add to Air Quality and Economics
 - California Low Carbon Fuel Standard
- Petroleum price spikes of 2008 showed growing interest for consumer vehicles
- Recognition by goods movement industry that petroleum price respite is temporary
- Supply / Availability of Natural Gas

High Fuel Use Fleets



Heavy-duty Vehicles



Goods Movement



MODEL
-386-



U.S. NGV Vocational Applications



Expanding Products and Markets

- Technology exists around the world and in U.S.
- Expand the numbers of engines & OEM available product
- Adapt technology to new engines and vehicle platforms
- Adapt technology for existing and future emission requirements
- Adapt NGV technology to include hybrid technologies



Potential for NGV Market Growth “NG Shift from Power Generation to NGVs”

Opportunity for NGV Market Growth

- ~70% oil imports to U.S.
- 175 billion gallons/yr of on-road transportation fuel
 - 135 billion gallons gasoline/yr for on-road applications
 - 40 billion gallons diesel/yr for on-road applications
- 6.87 TCF/yr natural gas for power generation
 - could be displaced by renewables to fuel NGVs
- Adding NG as transportation fuel
 - Full U.S. NG demand greater than 80 year supply
 - Without any natural gas imports

Opportunity for Petroleum Displacement

- What can 7 TCF of Natural Gas Displace?
 - 40% of on-road diesel = 16 billion gallons of diesel = 1 million trucks
 - 28% of on-road gasoline = 38 billion gallons of gasoline = 30-50 million LD vehicles
- Natural gas is only fuel that can achieve significant foreign oil displacement

Deployment Strategy

Deployment Strategies

- Heavy-duty
 - Target 1 million Class 7/8 trucks
 - Cornerstone is LA/LB Ports – Goods Movement (40% of U.S. trade)
 - Enables shift of regional trucking for other Class 5/6 vehicles
 - Fosters urban “cluster to cluster” bridges both CNG and LNG
 - Ultimately coast to coast
- Light-duty – page from OEM Hydrogen Handbook
 - Target regional cluster deployment strategy for 30-50 million vehicles
 - Educate society and dealer networks within clusters
 - Focus on regional sales and advertising
 - Lever cluster for mutual OEM and fuel provider sustainability

Deployment Strategies - Infrastructure

- HD Trucks – 16 billion DEGs
 - Primarily LNG for Class 7/8 trucks
 - Network of 2,000 – 5,000 stations nationwide – (ref: 9,000 truck stops in U.S.)
 - \$14-20 billion for station infrastructure
 - \$20-30 billion for LNG production facilities
- LD Vehicles – 38 billion GGEs
 - Predominantly CNG
 - Hydrogen network -12,000 stations address 70% of nation
 - Network of 20,000 to 45,000 stations (ref: 170,000 retail gasoline stations)
 - \$40-70 billion for station infrastructure

California Port Truck Traffic



US Department of Transportation
Federal Highway Administration
Office of Freight Management and Operations
Freight Analysis Framework

Estimated Average Annual Daily Truck Traffic: 1998

CALIFORNIA

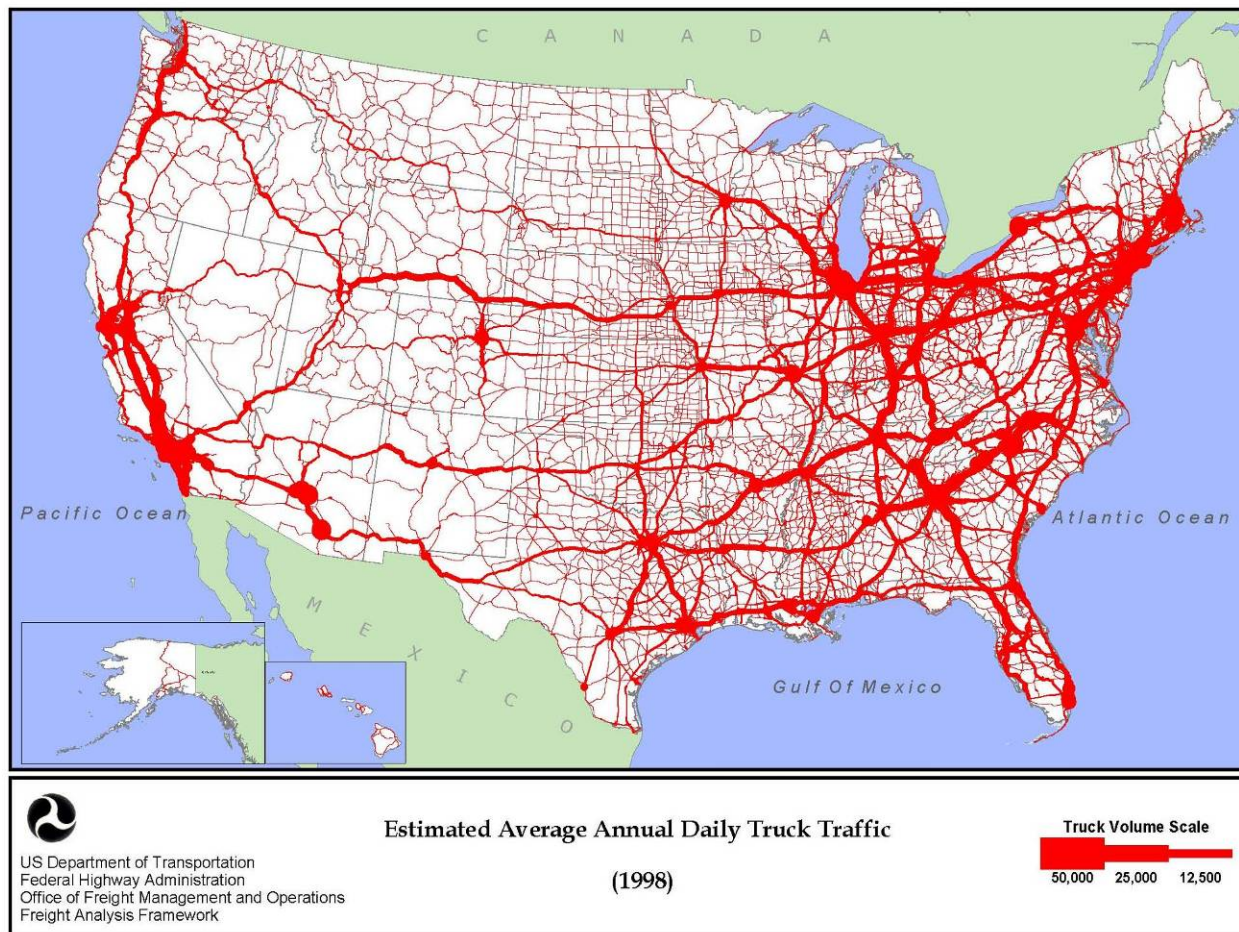
Truck Volume Scale



Los Angeles Ports



Truck Traffic 1998



-
- Southern California Natural Gas Fueling Stations**
- Los Angeles Basin**
- Clean Energy stations SoCal Gas/other stations
- www.cleancarmaps.com
- This map displays the Los Angeles Basin area, highlighting natural gas fueling stations. The map is color-coded: orange for land and blue for water. Major highways are shown as black lines with route numbers. Cities and towns are labeled in black text. Fueling stations are marked with icons: a blue square with a white 'C' and 'Clean Energy' text for Clean Energy stations, and a white triangle with a black 'S' and 'SoCal Gas' text for SoCal Gas/other stations. The map shows a high density of stations in the central and southern parts of the basin, particularly along major freeways like I-5, I-10, and I-405. The Pacific Ocean is visible on the left side of the map.

Conclusions

- **Future demands a New Market Development Strategy**
 - Not the way it was done in the 1990s
- Focus on targeted regional market development effort
 - Not a national product/infrastructure roll-out
- Large metropolitan areas
 - Select OEM dealerships
 - Minimize training and spare parts logistics
 - Co-op advertising with fuel providers
- Achieve successful deployment of vehicles and infrastructure
- With success – move to other metropolitan areas

Thank you!

For more information, please contact:

Mitchell W. Pratt

562-493-2804

mpratt@cleanenergyfuels.com

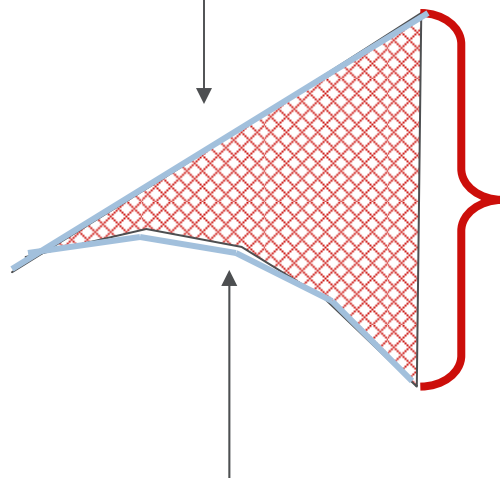
Following are additional slides that discuss 1) Oil Supply and Demand, Per Capita Vehicles in World, Pickens Plan, and Gas Shale Plays that Increase U.S. Supply of Natural Gas for the Future

2007 4th Qtr. OIL DEMAND

88 Million bbl/day

grows annually in a healthy world economy

2030 Projections: ~~120~~ 104 mmbpd



**Supply
cannot meet
demand**

- **PRICES
INCREASE**
- **SHORTAGES
DEVELOP**

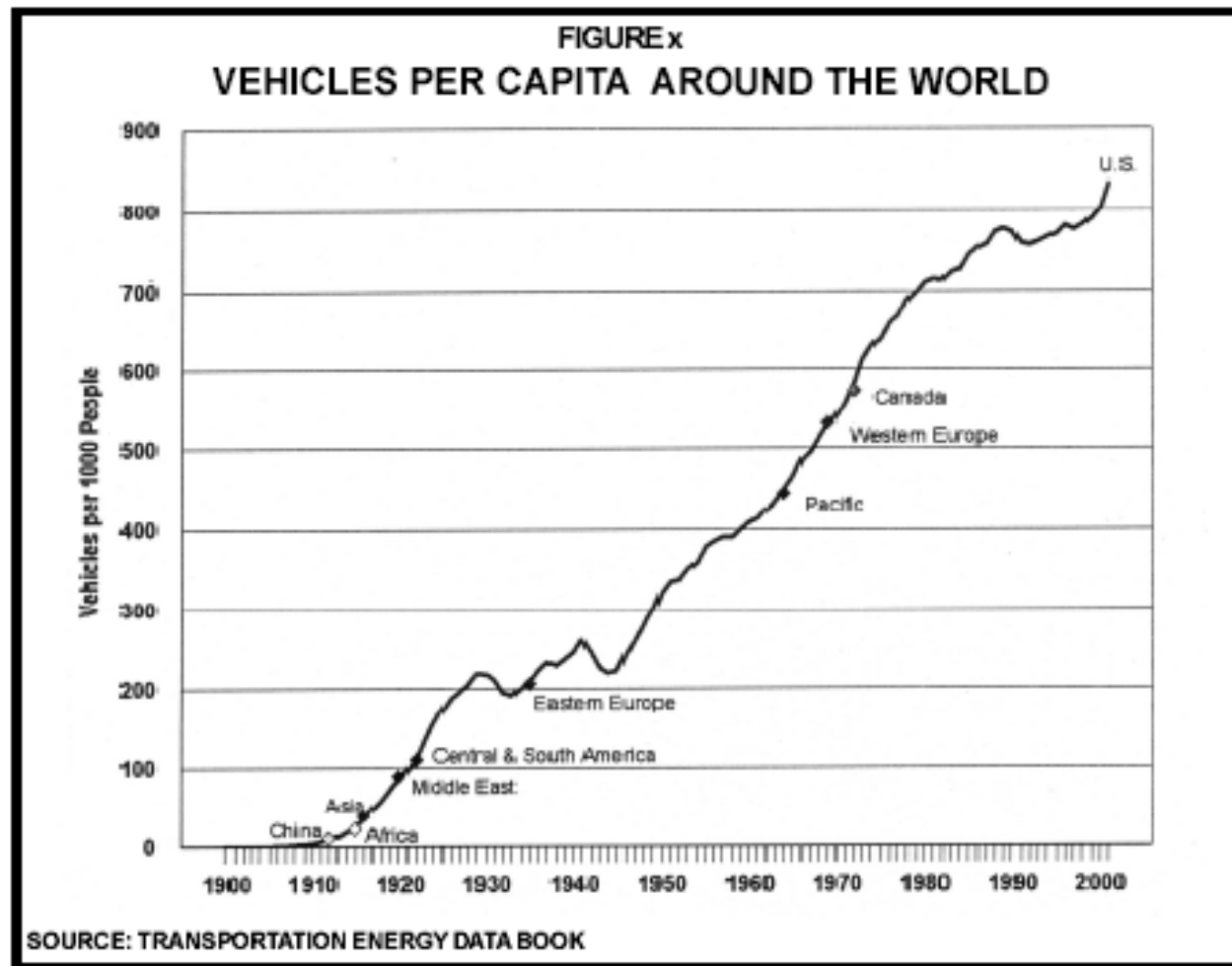
PRODUCTION reaches a maximum & then declines

(2030: 28 mmbpd current prod.)

(2030: 53 mmbpd incl. undev. fields)

85 Million bbl/day

Global Oil Demand Will Continue to Grow





PickensPlan

"To put it plainly, T. Boone Pickens is out to save America."

**-Carl Pope,
Executive Director,
Sierra Club**

IT'S TIME TO STOP AMERICA'S ADDICTION TO FOREIGN OIL

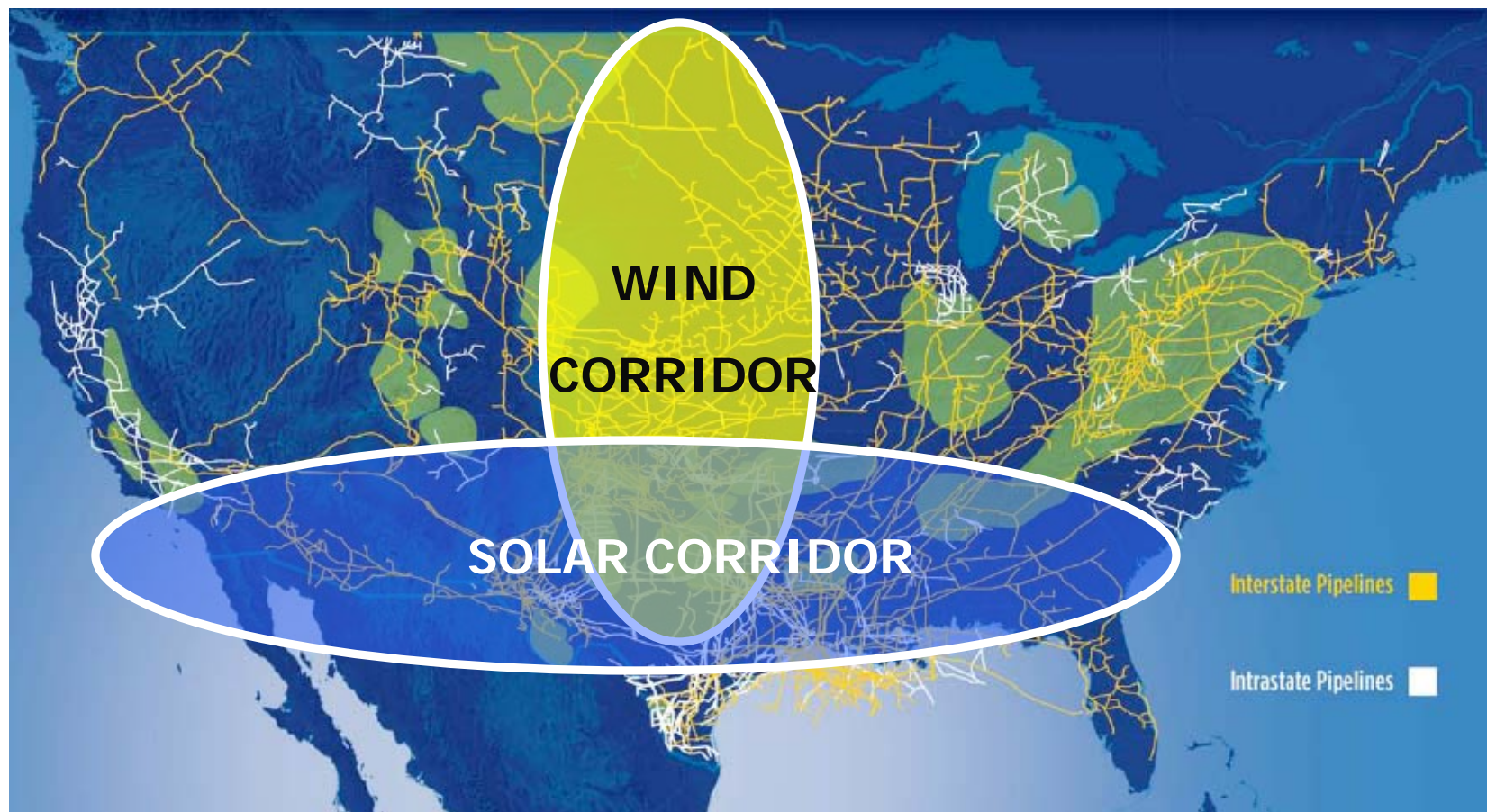
America is in a hole and it's getting deeper every day. We import 70% of our oil at a cost of \$700 billion a year - four times the annual cost of the Iraq war.

I've been an oil man all my life, but this is one emergency we can't drill our way out of. But if we create a new renewable energy network, we can break our addiction to foreign oil.

On January 20, 2009, a new President gets sworn in. If we're organized, we can convince Congress to make major changes towards cleaner, cheaper and domestic energy resources.

To get this done, I need your help. Check out the plan. If you think it's worth fighting for, please join our effort.

Potential for Renewable Power Generation



An Ocean of Natural Gas

- Only a few of the 22 top shale basins in the United States have been significantly explored
- Explosive growth in U.S. gas shales - Production increase from 0.3 Tcf/year in 1998 to 1.1 Tcf/year in 2007
- Since late 1990s, the largest producer of shale gas has been the Barnett Shale in the Forth Worth Basin = 6%
- Rapid increase in production rates in the Barnett, Fayetteville, Woodford, Haynesville and Marcellus Shale plays have spurred investment in pipeline infrastructure to bring this gas to the market
- **2240 TCF = 118 years**

