



Clean Energy[®]

North America's leader in clean transportation

Preparing for the Next Fuel Crisis

With Cheaper, Lower Carbon, American Natural Gas

Transport Topics Webinar December 4, 2008

About Clean Energy

Energy Market Update

Low Carbon Diet with Natural Gas

Tax Incentives for Natural Gas Vehicles

Natural Gas Fueling Infrastructure

Heavy Duty Natural Gas Engines & Trucks

About Clean Energy

- **Corporate Profile**

- Founded in 1997 as Pickens Fuel Corp
 - Became Clean Energy in 2002
- Over 135 employees nationwide + Peru
- 170+ fueling stations
- Headquarters in Seal Beach, CA

- **Comprehensive Services**

- Design, build & operate NG fueling stations
- LNG production & delivery
- Grant writing services (over \$100 million)
- Vehicle financing

- **Publicly-traded as **CLNE** on NASDAQ**



Largest Alternative Transportation Fuel Provider

250+
Fleet
Customers

14,000+
Natural Gas
Vehicles

170+
Natural Gas
Fueling Stations

Compressed Natural Gas (CNG)



Taxis



Government
Vehicles



Airport
Transit

Liquefied Natural Gas (LNG)



Regional
Trucking



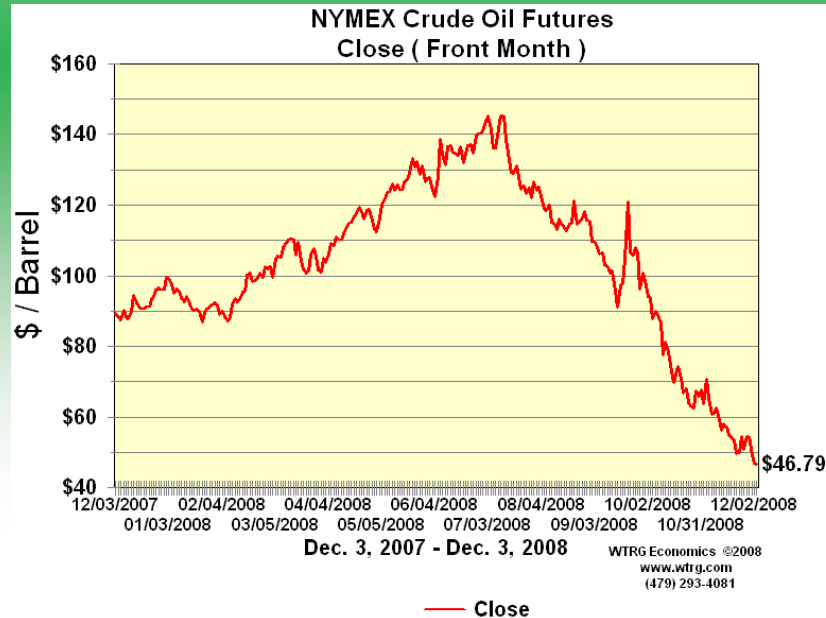
Public
Transit



Refuse
Hauling

The Energy Market

Oil Is Cheap – Why Care Anymore?



President-Elect Obama's View



Obama And The Presidency

60 Minutes

November 16, 2008

- **(CBS) Kroft:** When the price of oil was at \$147 a barrel, there were a lot of spirited and profitable discussions that were held on energy independence. Now you've got the price of oil under \$60.

Mr. Obama: Right.

Kroft: Does doing something about energy is it less important now than...

Mr. Obama: It's more important. It may be a little harder politically, but it's more important.

Kroft: Why?

Mr. Obama: Well, because this has been our pattern. We go from shock to trance. You know, oil prices go up, gas prices at the pump go up, everybody goes into a flurry of activity. And then the prices go back down and suddenly we act like it's not important, and we start, you know filling up our SUVs again.

And, as a consequence, we never make any progress. It's part of the addiction, all right. That has to be broken. Now is the time to break it.

T. Boone Pickens' View



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.

PickensPlan

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

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

The case for buying oil stocks

Investor Daily: Even with gas prices in free fall and the global economy sputtering, now may be the time to bulk up on oil shares (if you dare).

By [Brian O'Keefe](#), senior editor Last Updated: November 21, 2008: 7:26 AM

ETNEW YORK (Fortune) -- Last week, the Paris-based International Energy Agency released its World Energy Outlook 2008 - a 578-page book full of future supply, demand, and price estimates which this year also included an eagerly-awaited study of 800 of the world's largest oil fields. **Here's the executive summary: Buy oil stocks.**

- “Current global trends in energy supply and consumption are patently unsustainable — environmentally, economically, socially.”
- “Global primary demand for oil (excluding biofuels) rises by 1% per year on average, from 85 million barrels per day in 2007 to 106 mb/d in 2030.”
- “These projections are based on the assumption that the IEA crude oil import price averages \$100 per barrel (in real year-2007 dollars) over the period 2008-2015, rising to over \$120 in 2030.”
- “Production reaches 104 mb/d in 2030, requiring 64 mb/d of gross capacity additions – **six times the current capacity of Saudi Arabia** – to meet demand growth & counter decline”

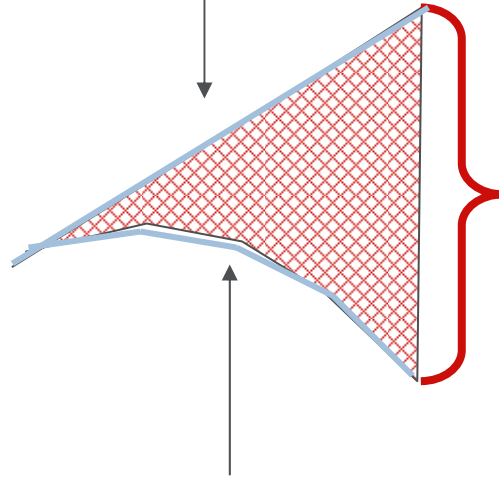
Global Oil Challenge

2007 4th Qtr. OIL DEMAND

88 Million bbl/day (mmbpd)

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

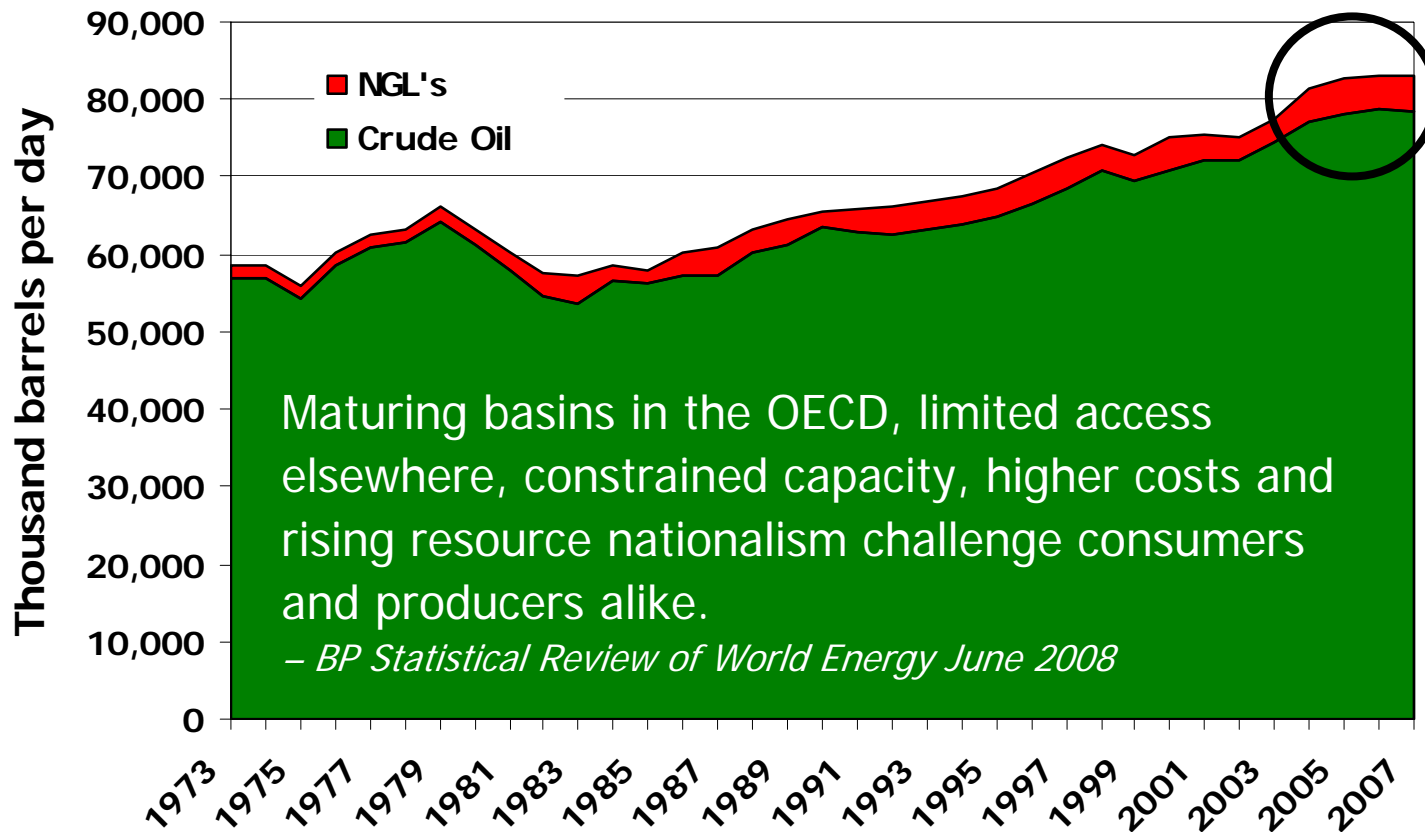
(2030: 28 mmbpd from current production)

(2030: 53 mmbpd incl. undeveloped fields)

85 Million bbl/day

The Oil Plateau Is Already Here

Global Oil Production

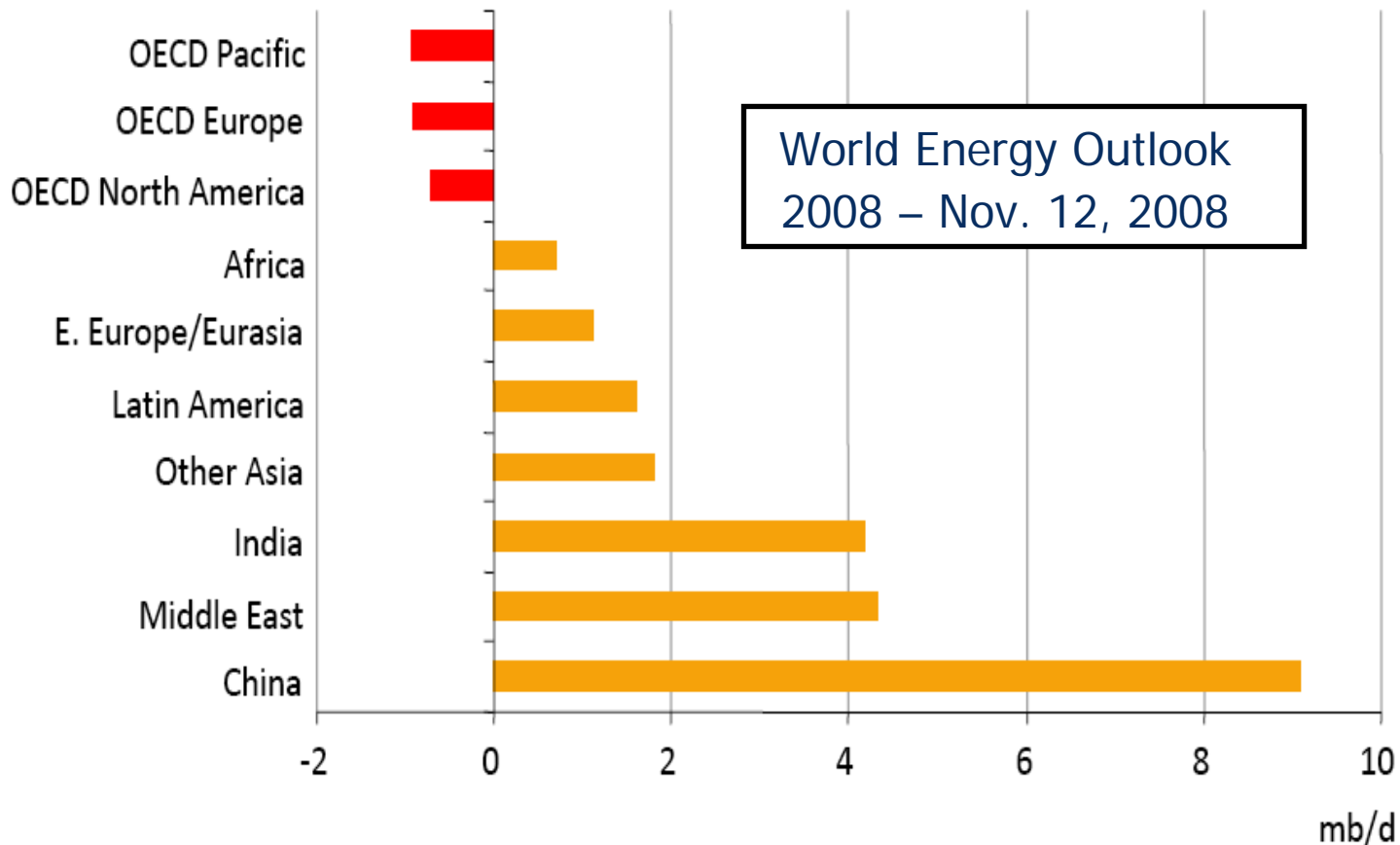


Has crude oil production already reached the plateau?

While the exact timing of peak oil production is subject to considerable debate, the inevitability is not; the U.S. peaked in 1971 with production down 50% since then.

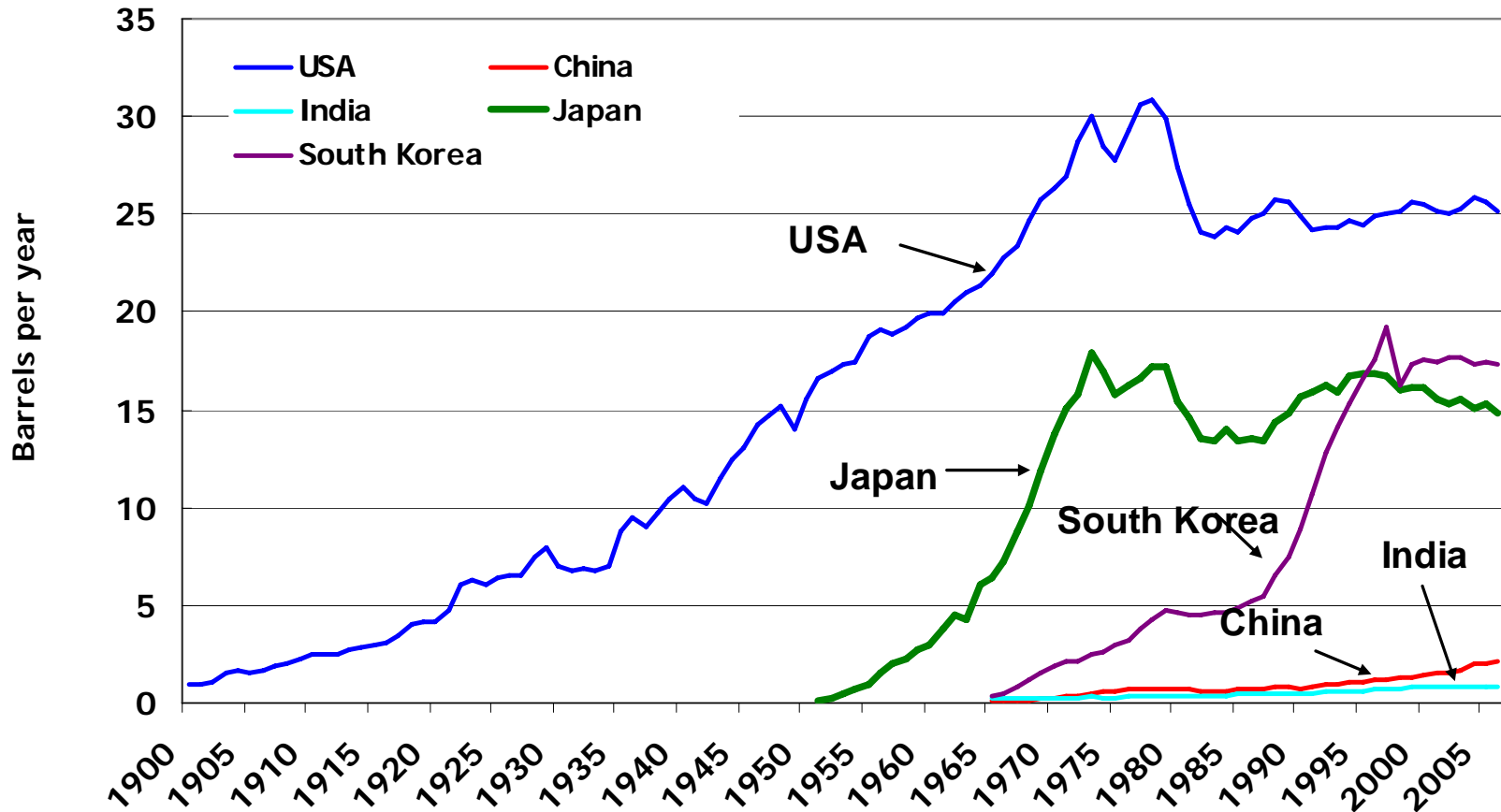
Why Natural Gas with Oil Prices at \$54/barrel??

- World oil production at 85 million barrels per day
- Demand growth forecasted



The World is Nowhere Near Peak Demand!

Per Capita Oil Consumption

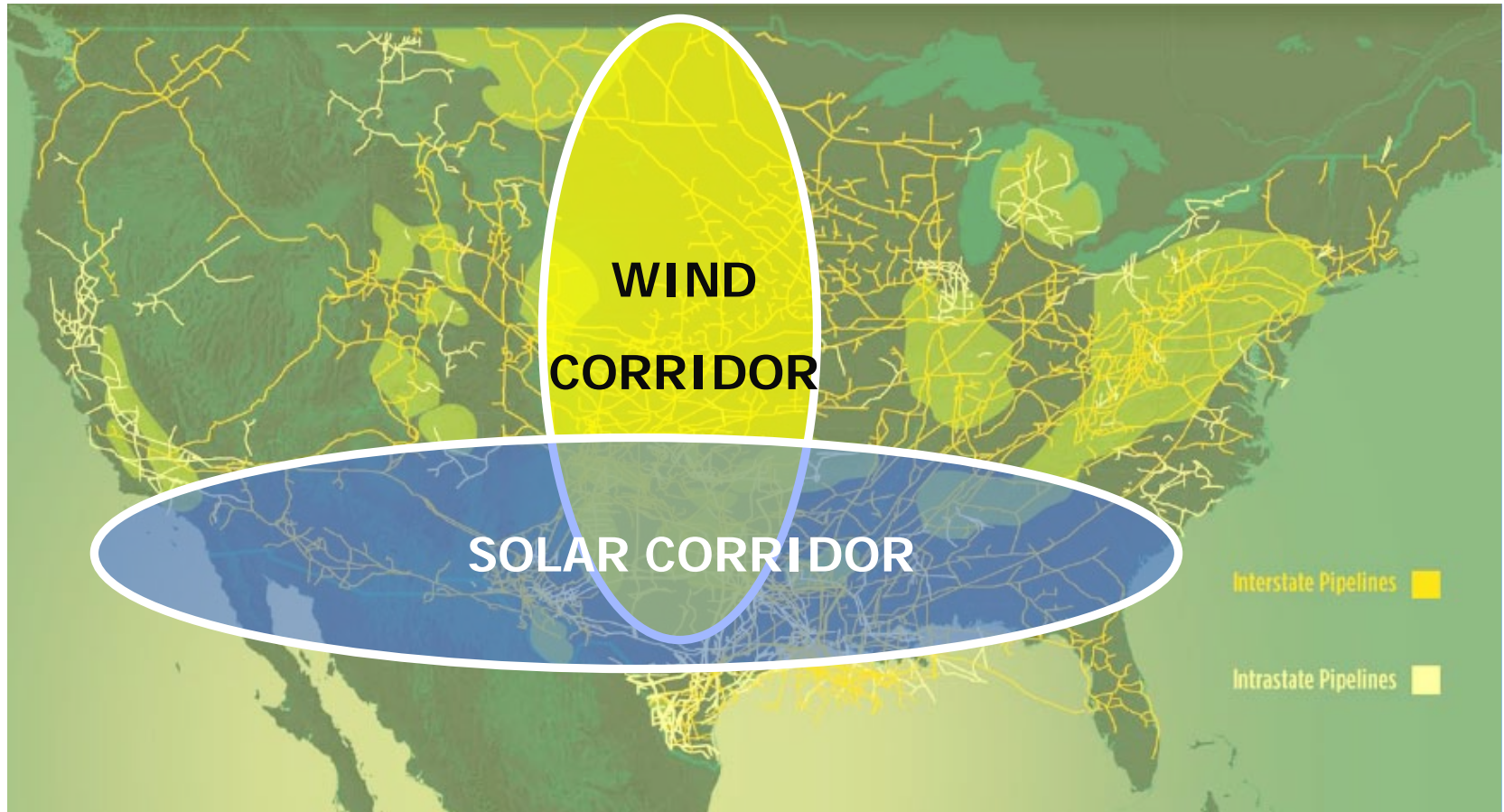


Rising standards of living and industrialization are on the verge of dramatically increasing per capita consumption in key emerging economies

Opportunity to Displace Foreign Oil – Think Big!

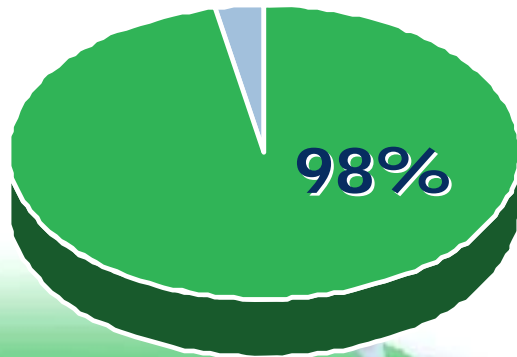
- ~70% of oil used by U.S. is imported
- 175 billion gallons/yr of on-road transportation fuel
 - 135 billion gallons gasoline
 - 40 billion gallons diesel
- What If – Use natural gas for transportation instead of power generation?
 - Use wind, solar, renewables to generate electricity
 - Diverts 6.87 TCF/yr natural gas from power generation to NGVs
 - Demand met without importing natural gas

Potential for Renewable Power Generation



Domestic Natural Gas Is Good for America

Natural Gas



- Supplied From US and Canada
- Imported

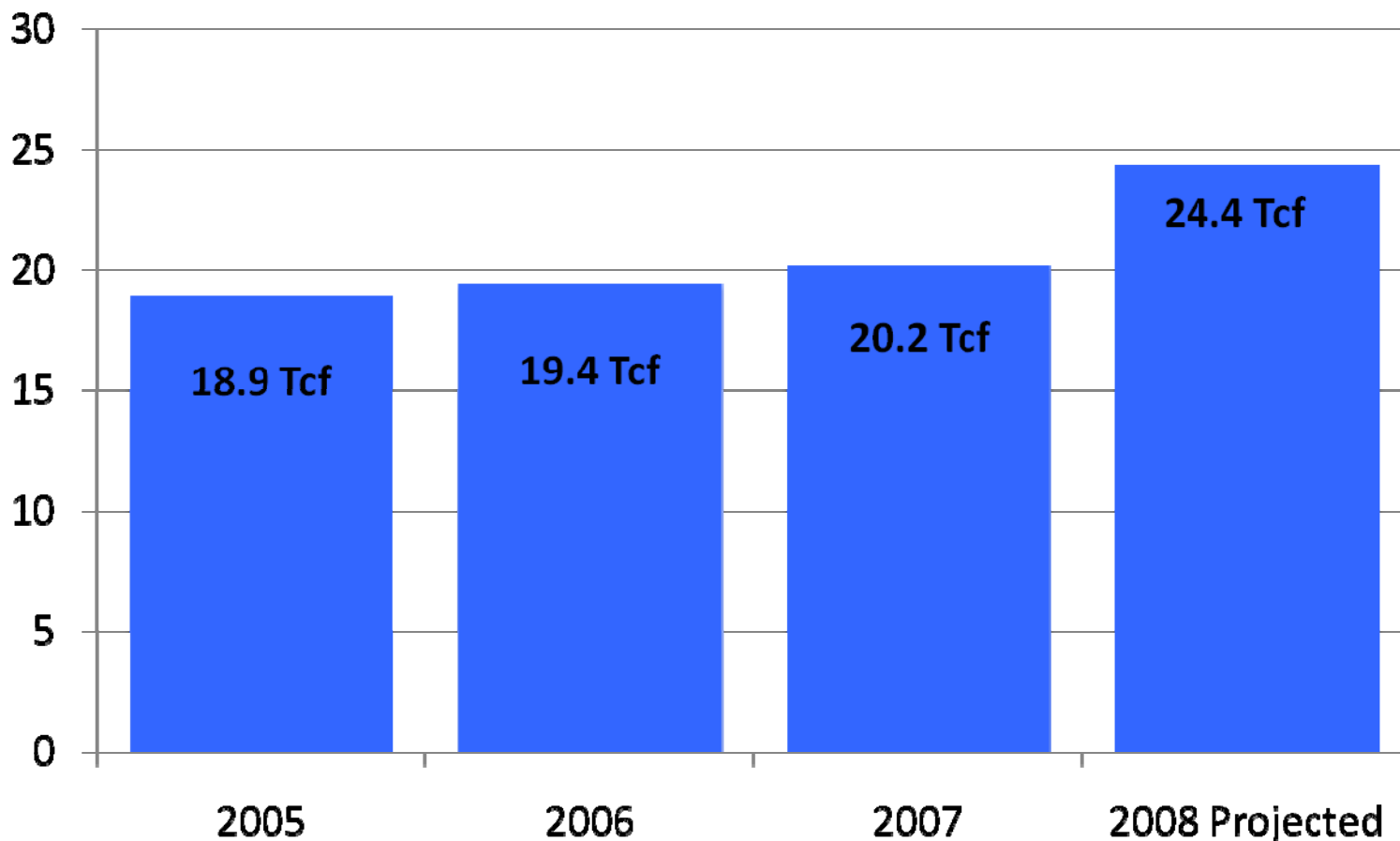
- Reserve Estimates Are as High as 120 Years
- World NG Reserves Estimated at 3x that of Oil
- Why Import Oil When We Have Our Own Energy?

An Ocean of Natural Gas Under Our Feet

- Explosive growth in U.S. gas shales - Production increase from 0.3 Tcf/year in 1998 to 1.1 Tcf/year in 2007
- Only a few of the 22 top shale basins in the United States have been significantly explored
- Since late 1990s, the largest producer of shale gas has been the Barnett Shale in the Forth Worth Basin
- 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**



U. S. Natural Gas Production is Steadily Rising



Source: EIA, U.S. Natural Gas Summary 03/28/08,
EIA Energy in Brief, June 11, 2008

Opportunity for Market Penetration

- What does 7 TCF 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
- Even if no electricity production is shifted to renewables, adding 7 TCF of annual consumption still provides 80 years of supply

Deployment Strategies - Infrastructure

- Heavy Duty Trucks – 16 billion DGEs
 - 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
- Light Duty 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

A 3-year economic stimulus program would produce 2.4 million jobs and build about 1/3 of the HD program and a significant part of the LD program

Low Carbon Diet with Natural Gas Fuel

- AB 32 Global Warming Solutions Act of 2006
 - Requires CA companies to reduce overall greenhouse gases (GHG) by:
 - 2000 levels in 2010, 1990 levels by 2020, and 80% by 2050
 - Proposed cap and trade market to be limited to CA sources, to start by 2010
 - President-elect Obama supported CA GHG goal on November 17, 2008
 - GHG emissions for companies include stationary and mobile sources
 - Low Carbon Fuel Standard will be implemented by 2010 and will help companies comply with AB 32
 - Standard requires 10% GHG reduction by 2020, 80% by 2050
 - Potential for companies to bank credits for early compliance
- AB 118 (Nunez): Clean Air and Alternative Fuels Plan
 - Provides \$210 MM annually to support clean air and low carbon fuel vehicles
 - Applications to CEC expected to open in 2009
- Natural Gas Trucks Reduce GHG up to 21% ---- and 88% Using Biomethane from Landfills, Sewage Plants, and Farm Waste

Low Carbon Renewable Natural Gas!

- Acquisition of McCommas Landfill, TX
- 3rd largest landfill in U.S.
- Produces 3.6 million cubic feet of gas per day
 - >29,000 gallons of fuel per day
- Provides a **renewable portfolio** for Clean Energy
- GHG benefits of renewable natural gas to be shared with customers



Greenhouse gas emissions can be reduced by 88% using biomethane generated by landfills, sanitation plants, and dairy farms

Tax Incentives for Natural Gas Vehicles

Vehicle Purchase Tax Incentives

- Federal Tax Credits

<u>GVW</u>	<u>Tax Credit (up to)</u>
8,501 to 14,000	\$8,500
14,001 to 26,000	\$20,000
26,001 +	\$32,000

- Deduct directly from the federal taxes owed
- Available to the vehicle purchaser
 - Fleet or vehicle buyer, or
 - Leasing company
- Fine Print
 - Exact credit based on IRS determination on the engine
 - Tax credits can be carried back to 2006 and forward to 2010
 - Tax credits are subject to Alternative Minimum Tax (AMT)
 - Tax credits expire 12-31-2010 with ongoing efforts to extend

Fuel Tax Incentives for Natural Gas Fuel

- Federal Volumetric Excise Tax Credit (VETC)
 - \$0.85 per Diesel Gallon Equivalent (DGE) dispensed
 - Intended for infrastructure costs (production & dispensing)
 - Scheduled to expire Dec-09, efforts underway to extend beyond
 - Annual benefit = $\$0.85 \times 20,000$ gallons = \$17,000 per year per truck
- California Fuel Use Tax Rebate
 - Available for operating a natural gas truck
 - Receive \$0.10 per DGE rebate from State Board of Equalization
 - Procure annual prepaid tax permit @ \$168 per truck
 - $\$0.10$ per DGE x 20,000 gallons - \$168 = \$1,832 net annual benefit per truck
- Texas Fuel Tax Incentive
 - Available for operating a natural gas truck
 - Prepay state fuel tax by paying \$744 for tax permit
 - State tax on diesel fuel is \$0.20 per DGE
 - $\$0.20$ per DGE x 20,000 gallons - \$744 = \$3,256 net annual benefit per truck
- Other States May Have Incentives

Fueling Infrastructure

Compressed Natural Gas (CNG) Basics

- Light, medium, and medium-heavy duty vehicles
- Gas delivered by pipeline to fueling station
 - Same gas that heats homes & used for cooking
- Gas is compressed at the station to 3600 psi for dispensing
- Dispensed similar to gasoline
- Stored in 1 or more cylinders on vehicle



Liquid Natural Gas (LNG) Basics

- Heavy and medium duty vehicles
- Pipeline gas cooled to -260F
- Produced at LNG plants
- Delivered in trailers to fuel stations
- Two “Grades” of LNG
 - Cold LNG for Westport HPDI compression engine
 - Saturation pressure \ll 90 psi
 - Saturated LNG for spark-ignited engines
 - Saturated at 90 to 100+ psi



LNG Production Plants Make the Fuel

Clean Energy's
Newest LNG
Plant in Boron,
California

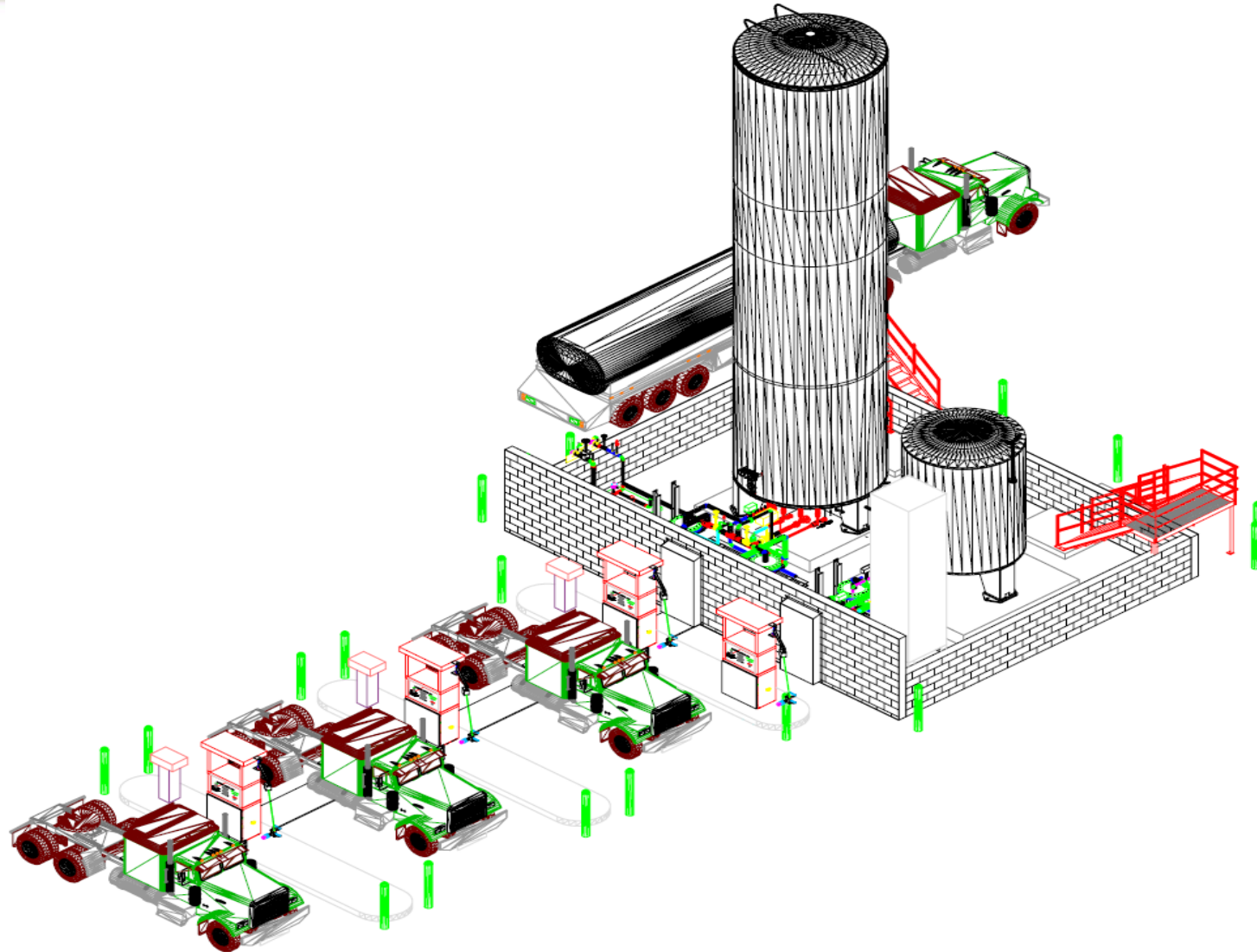
160,000 gal/day

Expanding to
240,000 gal/day
at end of 2009

1.5 Million
Gallons Storage



Typical LNG Station Configuration



Carson, CA Public Access LNG Truck Station

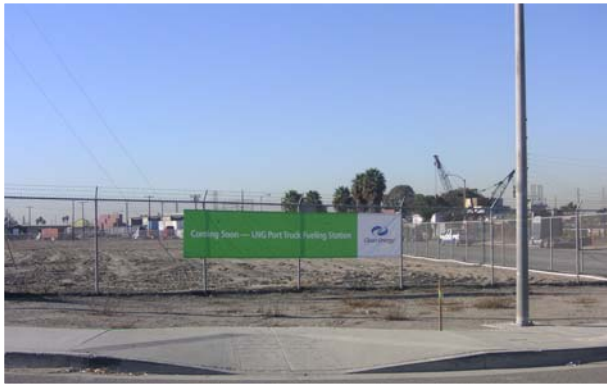


**Carson Truck Station
Grand Opening Dec-07**



Anaheim & I Street Station Largest NG Truck Stop in the World

- 10 Dispenser Lanes, 6 to Start
- 100,000 Gallons of Fuel Storage
- Groundbreaking Nov 2008
- Grand Opening Feb-Mar 2009



Heavy Duty Natural Gas Engines & Vehicles

Cummins ISX-G Engine from Westport Same Performance as ISX Diesel!



- 15 Liters
- Compression Ignition
- 400 HP, 1450 lb-ft torque @ 2,000 RPM
- 450 HP, 1650 lb-ft torque @ 2,000 RPM
- 80,000+ GVW
- Manual Transmission
- Fuel Type: LNG Cold Fuel
- Emission Benefits over New Diesel
 - 33% Lower NOx (0.8 grams vs. 1.2)
 - Minimal Diesel PM
 - Over 20% Smaller Carbon Footprint
- \$28,800 Federal Tax Credit



Kenworth T800



Peterbilt 386 & 388

ISL-G Engine from Cummins-Westport 2010 Compliant Today – No DPF or SCR!



- 8.9 Liters
- Spark Ignited
- 250 to 320 HP
- 660 to 1000 lb-ft Torque
- 66,000+ GVW
- Automatic Transmission
- Fuel Type: Saturated LNG or CNG
- Emission Benefits Over New Diesel
 - 83% Lower NOx (0.2 grams vs. 1.2)
 - No Diesel PM
 - Over 20% Smaller Carbon Footprint
- \$32,000 Federal Tax Credit



Autocar



Sterling LT8500
Thru Q1 2009



Freightliner M2
Q2 2009



Capacity Yard Tractor

Phoenix NG Engines from Emissions Solution Inc.



- Phoenix NG7.6
- Platforms
 - DT-466 (Replacements)
 - MaxForce DT (New Builds)
- 7.6 Liters
- Spark Ignited
- 175 to 265 HP
- 460 to 820 lb-ft
- 50,000 GVW
- Fuel Type: Warm LNG or CNG Fuel
- Emissions Benefits over New Diesel
 - 33% Lower NOx (0.8 grams vs. 1.2)
 - No Diesel PM
 - Over 20% Smaller Carbon Footprint
 - 2010 Compliance Has Been Proven, Certification Is Pending
- \$32,000 Federal Tax Credit



Coming Soon:
Phoenix NG 9.3
Based on Navistar
MaxForce 10
9.3L, 350 HP, 1200 lb-ft



Baytech GM and Isuzu Trucks

CNG Models Currently Available 2008/2009 Model Years

Vehicles Over 14,000 lb GVWR

- 8.1L GMC/Chevy C6500/C7500C/8500 Truck
- 8.1L GMC/Chevy C4500/C5500 Truck and Shuttle Bus
- 8.1L Workhorse Chassis
- 6.0L* Chevy Express/GMC Savana 4500 Cutaway Van
- 6.0L* GMC/Chevy W4500 & Isuzu NPR HD
- 6.0L* Workhorse Chassis (over 14,000 lb GVWR)

Vehicles Under 14,000 lb GVWR

- 6.0L* Sierra/Silverado 2500HD/3500HD Pickup
- 6.0L* GMC Sierra/Chevy Silverado 3500HD Chassis Cab
- 6.0L* Chevy Express/GMC Savana 2500/3500 Pass/Cargo Van
- 4.8L* Chevy Express/GMC Savana 2500/3500 Passenger Van
- 6.0L* Chevy Express/GMC Savana 2500/3500 Cutaway Van
- 6.0L* GMC/Chevy W3500 & Isuzu NPR
- 6.0L* Workhorse Chassis (under 14,000 lb GVWR)

*2009 Model Year only



C4500/5500/6500/7500/8500



GM W4500/ Isuzu NPR HD



Pictured: 2009 Express 4500 Cutaway

Express/Savana 4500 Cutaway Van

Natural Gas for Transportation



Cheaper



***Cleaner &
Low Carbon***



***Domestically
Available***

Thank You for Attending
Greg Roche
(562) 493 – 2804
groche@cleanenergyfuels.com