Natural Gas Supply from the Gulf of Mexico
ALERT: GAME CH**GER !!!
Gas Shales!!
- 100+ years of cleaner burning natural gas
Natural Gas Supply Sources
2002- Shale Plays
Mitchell Energy Led the Way

- 1950’s-1990’s.. George Mitchell produces gas from Ft. Worth Basin
- “small” oil & gas wells for many years
- The “source”--Barnett Shale--“Mother Lode”
- It was under “everything” for 5,000 sq mi!!
Shale Gas Supply
Shale Plays: Aquifer Protection

Several layers of steel tubes encased in cement protect groundwater supplies.

Protective Steel casing to shale.

Depth = 2 Miles.
Depth of Affected Region Affected by Hydraulic Fracturing

Fisher (2010)  
http://nwis.waterdata.usgs.gov/nwis/inventory
Domestic Independent Producers

Shale Discoveries = Barnett, Haynesville, Fayetteville, Marcellus, Bakken, Eagle Ford, Niobrara, Antrim, etc
“The Big Boys”

- Jan ‘10..TOTAL & Chesapeake—Now #3, $2.5 Billion!
- March 10’...Exxon-Mobile & XTO Energy—$41 Billion!!
- May ‘10..Quicksilver Resources partners with ENI (Italy)
- May ‘10...Shell...$4.7 B! buys East Resources (Marcellus)
- Nov ‘10...Chevron acquires Atlas Energy $4B! (Marcellus)
- Dec ‘10...CNOOC....1B! in Chesapeake Energy-Barnett
- Jan ’11..Quicksilver lease agreement-Reliance Energy (India)
- Feb 1 ‘11...CNOOC-1/3 of Niobrara (Colo) with CHK
- May 5 ‘11...Chevron Buys Chief O&G in Marcellus
- Jan 2012...Marubeni (Japan) in Eagle Ford (52,000 acres)
Can Natural Gas Recover?

**WHAT WE HAVE**

- Abundant Supplies
- Low Emissions
- Existing Technology
- Domestic Fuel
- Sustainable for Decades
- CHEAP!!

**WHAT WE NEED**

- Infrastructure
- Incentives
- Better Price
- Demand
- Competition
- MARKETS!!

Cost for a BOE = ??
Nat Gas = $18
Oil = $95!!!!!!!
The Texas NGV Triangle (Clean Transportation)

Texas SB-20

- Cooperative effort between natural gas producers, fleet customers and state government.
- 20% of TERP Money (Texas Emissions Reduction Plan) -- $20-$30 million
- DFW to Austin-San Antonio to Houston
- 20% for new stations offering public LNG and CNG—grants for 20 new stations
- 80% for government rebates for fleet owners for HDVs-500 Trucks
Detroit—GM, Ford, Chrysler

Change for 2012-13!!
Shell & TA Centers!

Shell Oil and truck stop chain TravelCenters of America agreed to build and operate at least 100 natural gas fueling stations for heavy-duty trucks along U.S. Interstates.
New Public CNG Stations
3M to Make Fuel Tanks for Natural Gas Vehicles

The manufacturing giant, intends to develop less-expensive, higher-performance, lighter, and higher-capacity fuel tanks—which it hopes will jump-start the market for natural gas-fueled vehicles.

Carbon Fiber and new Nanoparticles for extra strength

Up to 20% lighter and 20% greater capacity
Expanding NG Markets!!

1. CNG
   Transportation Fuels

2. LNG

Back-UP Fuel

Base Fuel

Hydrogen Source
NYMEX Natural Gas Futures Prices
Physical Gas Procurement
Then and Now

• **MLGW Gas Purchases 1984**
  • One supplier
  • One pipeline with storage
  • One known low fixed cost (tariff rate)

• **MLGW Gas Purchases 2012**
  • Up to 50 different physical suppliers
  • Manage 3 pipelines and underground storage
  • Variable prices ranging from $2.00 to $14.75
  • Prices change every day, month and season
## 7 Year Gas Purchase Costs

<table>
<thead>
<tr>
<th>Year</th>
<th>MMBtu Purchased</th>
<th>$/MMBtu</th>
<th>$ AMT Purchased</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>42,530,480</td>
<td>$8.668</td>
<td>$368,652,444.71</td>
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<tr>
<td>2006</td>
<td>37,641,447</td>
<td>$7.331</td>
<td>$275,959,857.00</td>
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<td>2008</td>
<td>45,209,400</td>
<td>$8.343</td>
<td>$377,194,500.52</td>
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<tr>
<td>2009</td>
<td>39,505,317</td>
<td>$3.817</td>
<td>$150,790,352.79</td>
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<tr>
<td>2010</td>
<td>42,840,795</td>
<td>$4.419</td>
<td>$189,315,344.12</td>
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<tr>
<td>2011</td>
<td>35,452,840</td>
<td>$3.867</td>
<td>$137,095,103.35</td>
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<tr>
<td></td>
<td>286,777,876</td>
<td></td>
<td>$1,784,397,324.06</td>
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</tbody>
</table>
## 7 Year Pipeline Costs

<table>
<thead>
<tr>
<th>Year</th>
<th>ANR</th>
<th>Trunkline</th>
<th>PEPL</th>
<th>Texas Gas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>$1,719,449</td>
<td>$6,827,752</td>
<td>$0</td>
<td>$17,319,263</td>
<td>$25,866,464</td>
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<tr>
<td>2006</td>
<td>$1,715,815</td>
<td>$6,615,014</td>
<td>$0</td>
<td>$17,071,135</td>
<td>$25,401,964</td>
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<tr>
<td>2007</td>
<td>$1,698,222</td>
<td>$7,368,515</td>
<td>$1,709,194</td>
<td>$17,075,860</td>
<td>$27,851,791</td>
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<tr>
<td>2008</td>
<td>$1,704,895</td>
<td>$8,013,819</td>
<td>$1,471,299</td>
<td>$17,124,053</td>
<td>$28,314,066</td>
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<tr>
<td>2009</td>
<td>$1,697,623</td>
<td>$8,022,737</td>
<td>$1,467,268</td>
<td>$17,099,594</td>
<td>$28,287,221</td>
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<td>2010</td>
<td>$1,798,556</td>
<td>$8,032,135</td>
<td>$1,462,122</td>
<td>$17,049,192</td>
<td>$28,342,006</td>
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<tr>
<td>2011</td>
<td>$1,347,503</td>
<td>$8,077,736</td>
<td>$1,434,144</td>
<td>$17,183,085</td>
<td>$28,042,469</td>
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</tbody>
</table>

| Total | $11,682,064 | $52,957,708 | $7,544,026 | $119,922,183 | $192,105,981 |