Maximizing Resources through Regional Partnerships

Engineering and Technical Skill Sets to Support Development of the Eagle Ford Shale

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Agenda

- Eagle Ford Shale (EFS) Overview
- SBI Pipeline Engineering Background
- Current Education / Workforce Statistics
- Engineering Skills Needed in EFS
- Technical / Operation & Maintenance Skills Needed in EFS
- Summary
The Upper Cretaceous Eagle Ford Shale (EFS) is an emerging play in South Central Texas with estimated recoverable reserves of approximately 150 trillion cubic feet of natural gas.

EFS’s crude, high condensate (light crude, near unrefined gasoline) and natural gas liquids (NGL – ethane, propane, butane) content distinguish it from other shale plays and make it one of the highest quality plays in the United States.

Shale formations in the Eagle Ford occur as a widespread sheet approximately 40 to 400 ft thick.

Productive depth occurs between 4,000 ft and 14,500 ft total vertical depth.

Current activity is widely centered in 14 different Texas counties, running in a southwest-northeast band from Webb to Burleson counties.

To date, production includes dry gas, oil and wet gas.
Eagle Ford Shale Economic Impact

- Oilfield development affects the Eagle Ford region’s economy through several channels:
  - Lease payments, drilling expenditures, pipeline and other infrastructure construction, royalties, and the purchase of local goods and services.
  - 2021 Projected Revenue - $62-90 Billion

- Lease payments are made to reserve the mineral rights on a specific property:
  - Most studies assume that the bulk of these one-time lease payments—perhaps as much as 95 percent—is converted to savings and wealth.
Eagle Ford Shale Economic Impact

- Industries that stand out as the biggest winners from the combination of direct, indirect and induced spending include:
  - oil exploration and services, construction, wholesale and retail trade, and real estate

- Direct expenditures associated with drilling have a multiplier effect, while this surge in drilling has brought strong employment and wage growth to the South Texas regional area.
  - For the five counties where the job growth rate has been the strongest—McMullen, Dimmit, La Salle, Live Oak and Lee
  - Average weekly wages have increased significantly
  - For the entire 23-county area in 2011, seasonally adjusted retail sales increased at a 15.4 percent annual rate, or $580.7 million.

- All data clearly indicates that robust growth will continue, although energy prices are difficult to predict.
SBI Pipeline Engineering
Background
Pipeline Division
Project Requirements
Engineering

- Engineering, Procurement, and Construction Management (EPCM)
  - Production & Gathering Pipelines
  - Transmission Pipelines
  - Treating & Conditioning Facilities
  - Compressor & Pump Stations
  - Meter & Regulator Stations
  - Terminals & Storage Facilities
Pipeline EPCM Services

Engineering

• Program Management
• Front-End Engineering & Design (FEED) Studies
• Conceptual & Detail Design Engineering
• Mapping & GIS Software
• Piping System Computer Modeling
• Environmental Permitting
• Sustainability Services with LEEDS Accredited Professionals
• Inspection Services
• Procurement/Subcontracting Services/Material Management
• Construction Management
Pipeline Field Services
Installation

- **INSPECTION**
  - Chief Inspectors
  - Certified Welding Inspectors
  - NACE Inspectors
  - Utility Inspectors
  - Hydro-testing Inspectors
  - Environmental Inspectors
  - Mechanical & Civil Inspectors
  - Electrical/Instrumentation Inspectors
  - NDE Auditors
  - Source Inspection

- **CONSTRUCTION MANAGEMENT**
  - Construction Managers
  - Safety Personnel
  - Material Handlers
  - As-Built Technicians
  - Code Compliance
Current Education / Workforce Statistics
Only one in five 8th grade students enrolled in Texas public schools completes any level of valid postsecondary credentialing (certificate or degree) within 11 years.\(^2\) NCHEMS drew this conclusion from unit record data on the 883,260 Texas students who began 8th grade in 1996 through 1998. After 11 years, NCHEMS identified 175,489, or 19.9 percent, from these 8th grade cohorts who completed a certificate or degree program in Texas. Even with a slight adjustment in these results to account for an estimate of out-of-state completions, the rate rises to only 21.9 percent.
Cohort: A cohort is a collection of individuals who are grouped together in a statistical analysis because they have at least one particular characteristic in common.
CHART 2: TEXAS 8TH GRADE COHORT PROGRESSION BY GENDER (COMBINED COHORTS)

- 8th Grade: 100% Male, 100% Female
- Higher Education Enrollee: 47.9% Male, 57.2% Female
- Higher Education Credential: 16.1% Male, 23.9% Female
CHART 3: TEXAS 8TH GRADE COHORT PROGRESSION BY RACE/ETHNICITY (COMBINED COHORTS)

- **8th Grade**
  - Native American: 100%
  - Asian: 100%
  - Black: 100%
  - Hispanic: 100%
  - White: 100%

- **Higher Education Enrollee**
  - Native American: 43.4%
  - Asian: 72.7%
  - Black: 47.2%
  - Hispanic: 40.9%
  - White: 61.8%

- **Higher Education Credential**
  - Native American: 14.1%
  - Asian: 41.3%
  - Black: 11.4%
  - Hispanic: 11.6%
  - White: 27.6%
CHART 5: COMPARATIVE 8TH GRADE COHORT PROGRESSION OVER 10 YEARS

- 8th Grade:
  - Texas: 100%
  - Florida: 100%
  - National: 100%

- Higher Education Enrollee:
  - Texas: 52.4%
  - Florida: 37.4%
  - National: 75.7%

- Higher Education Credential:
  - Texas: 19.9%
  - Florida: 17.2%
  - National: 29.3%

Legend:
- Texas
- Florida
- National
The Higher Education Challenge Facing Texas

October 18, 2011

Woody Hunt
Chairman
Texas Business Leadership Council
The Challenge
Challenges Texas Must Address to Maintain a Globally Competitive Workforce

- Raise education attainment levels to meet or exceed our competitors
- Shrink disparities across race and ethnic groups
- Get more students into high-demand technical fields
- Improve skills of adult population by bringing them back into the education system
Percent of Adults with an Associate Degree or Higher by Age Group
Texas, Mexico, US & Leading OECD Countries, 2009

Source: OECD, Education at a Glance 2011
Workforce Impacts

• The Eagle Ford Shale, believed to be one of the most significant oil and gas plays in the country.

• Economic Impact 2011 - $25 billion

• Activity will continue to grow in the area, and by 2021, the estimated economic impact is expected to reach more than $62 - 90 billion, with 117,000 new jobs projected in the EFS counties most affected.

• Risks associated with such a dramatic economic upturn
  – The enormous influx of workers is overwhelming the local economies.
  – Cities are struggling to provide housing and other basic necessities quickly enough to meet the current needs.
  – Residents have experienced housing prices skyrocket because demand far exceeds supply.
  – With this unprecedented growth, Eagle Ford Shale communities must plan, invest and diversify their economic bases if they want to thrive.

Source: Ashley Festa, UTSA Small Business Development Council May 2012
Workforce Challenges & Solutions

• Current Challenges
  - Labor Shortages (skilled and unskilled)
  - Housing Shortages
  - Water Shortages
  - Congestion / Road Deterioration
  - Limited Training Opportunities

• Potential Solutions
  - Targeted Academic Programs, Degree Plans & Certifications
  - Texas-Back-to-Work Initiative
  - On-the-Job Training
  - Job & Hiring Fairs
  - Texas Veterans Leadership Program (TVLP)
  - Skills Development Fund - Texas Workforce Commission

Source: Texas Workforce Commission Annual Forum 2012
Engineering Skills Needed in Eagle Ford Shale
Engineering Positions

- Project Management
- Construction Management
- Planning and Design
- Process Engineering
- Civil, Mechanical, Electrical, I/E Engineering
- Control Systems
- Modeling
- Production Planning
- Measurement Devices
- Facilities Design
- Systems Simulation
- Operations / Maintenance
3D Modeling
Separator Ortho View
3D Modeling
Tank Farm Side View
Piping Drawings Exhibit
Technical / Operational & Maintenance Skills Needed in Eagle Ford Shale
Technical / Operations & Maintenance Positions

- Transportation (CDL Operators)
- Right-of-Way and Site Maintenance
- Pipeline Operators
- Welding & Repairs
- Protection/Corrosion Control
- Meter Stations
- Flow Measurements
- Pumps & Compressor Stations
- Gas Turbines & Auxiliary Systems
- Troubleshooting & Failure Technicians
- Reliability Assessments
- Gauges
- Generators
Source: PJP4 Services
Laredo Community College – Oil & Gas Lab Training Facility Institute Project

PROPOSED INDOOR LAB MOORE VOCATIONAL BLDG.

PROPOSED OUTDOOR TRAINING SITE

Mixture 2    Mixture 1        Oil Water       (Colored) Gas    (Air) Gas
EXPANSION
SEPARATORS
(2) Phase   (3) Phase
WELLHEADS
CONTROLS
ELECTRIC PANELS
HEATER - TREATER
(Pump)
LCC Certificate Programs
Workforce Education

- Oil & Gas Specialization Program
- Welding School
- Truck Driving School (CDL & HAZMAT Endorsement)
Summary

• Shortage of Engineering and Technical Talent
• Business and Education Institutions need to Partner
• Must make Education a State & National Priority
• Given Condition of Global Economy, South Texas is a great place to Reside and Work
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Questions & Answers

Eagle Ford Shale’s best areas
Counties with most drilling activity shown

Shale regions producing:
- Oil
- Wet gas, condensate
- Dry gas

San Antonio Express-News