Today’s Topics

- **Introduction**
  - IHS and Purvin & Gertz, Inc.

- **Outlook Dimensions**
  - Oil/Gas Ratio
  - Heavy Crude Discount

- **Western Canadian Natural Gas Outlook**

- **Western Canadian NGL Outlook**

- **North American Propane Supply and Exports**
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- Independent energy consulting firm
- Founded in 1947
- Owned by consultants
- Headquartered in Houston with offices Worldwide

Some of what we do...
- Energy Market Analysis
- Competitive Benchmarking
- Mergers and Acquisitions
- Refinery Economics and Planning/PIMS
- Project Evaluation
- Project Finance Assistance
- Strategic Planning
IHS has acquired Purvin & Gertz, Inc.
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• Serve businesses and all levels of governments worldwide
  • Ranging from 80% of Global Fortune 500 to small businesses
  • Customers in 180 countries

• Provide comprehensive content, software and expert analysis and forecasts

• Customers around the world use our products and services to make faster and more confident decisions.

Advancing Decisions that Advance the World
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- Energy & Power
- Design & Supply Chain
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- Country & Industry Forecasting
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Two Important Dimensions for Our Outlook

Oil to Gas Price Ratio (MMBtu/bbl)

Heavy Crude Discount (%)

- **Oil/Gas Ratio**
- **Heavy Crude Discount (%)**
Major Drivers for Energy Development in Alberta

Low Oil/Gas
- Expensive Gas
- Low Frac Spreads
- Bitumen production favoured
- Upgrading uneconomic
- High diluent demand
- Coke gasification for fuel

High Oil/Gas
- Cheap Gas
- High Frac Spreads
- Bitumen production favoured
- Upgrading uneconomic
- High diluent demand
- Natural gas for fuel/syngas

Wide
- Low Frac Spreads
- Upgrading economic
- Offgas availability
- Pitch gasification for fuel
- Coker GO derivatives
- Bitumen to refined products

Narrow
- High Frac Spreads
- Upgrading economic
- Sweet, high quality SCO
- Offgas availability
- Natural gas for hydrogen
- High quality diesel
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Western Canadian Natural Gas

- Shale gas development is a game changer in North America
- Western Canadian natural gas supply is declining as a result of weak prices and a dramatic decline in gas directed drilling
- Western Canadian industrial demand (oil sands) is growing and exports are falling
- Infrastructure needs to be developed for new supplies but existing infrastructure still needs to be paid for
- Long term outlook is uncertain – is it “half full or half empty”? 
North American Shale Gas Basins

Source: National Energy Board, Canada
Natural Gas Price

HENRY HUB TO ALBERTA AECO NIT BASIS

US$/MMBtu

Basis


IHS

Purvin & Gertz Inc.
Western Canadian Gas Well Completions

CUMULATIVE GAS WELLS COMPLETED
(Western Canada)

Source: CAODC
AECO Differentials are Declining
Western Canadian Gas Exports

Export Capacity

TransCanada 2011 Outlook

P&G Gas Export Outlook

Bcf/d

Prices and drilling are at very low levels but will recover eventually.

Well productivity has increased with horizontal technology improvements.

Large supply availability implies that long term gas price is set by drilling and production costs.

Unconventional gas supply growth will offset conventional gas declines.
- Considerable debate regarding future split of conventional/unconventional gas supplies.

Many producers (if not all) are pursuing oil or “rich” gas plays in order to capture liquids uplift.
WCSB gas prices have disconnected from traditional transportation cost discounts to markets
- Implies that transportation capacity is not worth very much

Existing pipeline and processing infrastructure is seriously over capitalized
- Many gas processing facilities are operating at well below capacity
- But processing margins are strong which is driving new infrastructure investment

Pipeline issues will consume industry attention
- TCPL toll restructuring and NEXT
- Alliance post 2015

Is a period of rationalization inevitable?
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A high crude/gas price ratio implies high frac spreads

All available NGL (C3+) will be recovered

Straddle plant economics will be under pressure
- Likely shift from straddle to field recovery in Western Canada
- Declining export flows and shifting feed composition
- Recent sharp increase in extraction rights premiums

Uncertainty regarding ethane recovery
- Higher cost for field extraction
- Increased intra-Alberta gas demand will shift flows
- Effectiveness of NGTL streaming is uncertain
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NGL Supply Drivers
What Causes Production to Change?

- **NGL is a BYPRODUCT**
  - There are no NGL wells!

- **NGL is produced as a byproduct of:**
  - Oil production (via the processing of associated gas)
  - Gas production (via the processing of non-associated gas – including LNG)
  - Refining

- **NGL production tends to change quickly when one or more of the above industries is changing quickly**
At the beginning of 2006, gas plants produced about 1.45 million barrels per day of NGLs. The increase was caused by rising production of natural gas in the U.S. and very attractive processing margins. Current production is near 1.9 million barrels per day. The increase was caused by rising production of natural gas in the U.S. and very attractive processing margins.
Recent History for Propane Supply
Many Regions are “Have-Nots”

- A tight international market continues to cause high prices in Europe, Latin America and Asia
- Supply projects in the Middle East (mostly LNG) are coming on slower than once predicted, but most should be completed soon
- Algeria’s production is down due to gas pipeline maintenance
- Terminal maintenance in the North Sea during the summer in 2010 constrained volumes which haven’t completely recovered
Most of North America is a “Have” Market

- **Shale gas plays in many regions resulted in:**
  - Rising production of natural gas
  - Thus, weak prices for gas
  - Thus, very strong gas processing margins
  - Which all led to rising production of propane

- **More propane in the U.S. resulted in relatively weak prices, which created an arbitrage that supported U.S. exports**
The U.S. Has Been One of the Cheapest Sources of Propane in the World

Daily Average, Barrels per Day

U.S. Propane Exports Set Record Highs in 2010/11

The U.S. Has Been One of the Cheapest Sources of Propane in the World
U.S. Propane Inventories

 Thousands of Barrels

- 5-Yr MIN-MAX Range
- U.S. Inventories
- Monthly 5-Yr Avg


20,000
50,000
80,000
100,000
Total Canadian Propane Stocks Are Adequate

Canada Spec C3 Inventories

Thousand Barrels

5-Yr Min - Max Range
5-Yr Average
Canadian Inventories


5-Yr Min - Max Range
5-Yr Average
Canadian Inventories

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000

Canadian Inventories
U.S. Propane Imports from Canada Have Been Declining

Barrels Per Day

Jan-04 Jul-04 Jan-05 Jul-05 Jan-06 Jul-06 Jan-07 Jul-07 Jan-08 Jul-08 Jan-09 Jul-09 Jan-10 Jul-10 Jan-11

Monthly Imports
Linear (Monthly)
Canadian Natural Gas Issues Summary

- **Drilling continues to languish**
  - Drilling focus has shifted to oil and liquids rich gas
- **Long-term impact must be lower production**
- **Rate of shale gas development is uncertain**
- **Domestic demand is increasing and exports are declining**
- **When will natural gas prices be high enough to encourage more drilling?**
NGL Issues Summary

- **Frac spreads remain high**
  - All available NGL will be recovered
  - New infrastructure is required while existing infrastructure is underutilized

- **US propane inventories are very low going into next winter**
  - Prices are expected to strengthen
Conclusions

- **Successful navigation through this period of uncertainty is critical to the future competitiveness of the Western Canadian natural gas and NGL businesses**
  - Issues such as TCPL tolls, Alberta Hub concept, NGL ownership (Receipt Point Contracting or NEXT) and Incremental Ethane Extraction (IEEP) are extremely complex
  - There is no obvious simple resolution to any of these issues

- **Cost must be removed from the system**
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