Retail Gas Market Overview

February 10, 2019

Outline

- Major supply functions
- Pricing overview
- Risk and risk management
- Commodity & capacity planning

Main Supply Functions

Pricing
- Pricing philosophy and process
- Cost components

Risk Mgmt.
- Risks
- Load forecasting
- Hedging

Commodity and Asset Mgmt.
- Process
- Supply reliability
- Term
- spot

Pricing Philosophy

- Two main objectives
  - Capture all costs and risks in the price
  - Try to develop a price that's attractive to the market
- Bottom up pricing
  - First, all costs to serve a customer are calculated and then a margin is added to arrive at the price that's offered
- Many cost components are either market or tariff based
- Use of risk premiums is a point of differentiation among suppliers
  - Covering volumetric changes
  - Cashout/penalty risk
- Some suppliers buy their supply components (financial hedges, physical supply, assets) in advance. Others wait until after the customer is signed

Components

Market Based

- NYMEX
  - Price of gas at Henry Hub, LA
  - Traded financially and physically
  - Very liquid
- Basis
  - Price of gas at various regional points
  - Traded financially and physically
  - Liquidity depends on region

Asset Costs

- Costs of physical assets like pipeline capacity and storage
- Costs can be tariff or market based
- Typically consist of fixed and variable costs

Risk Premiums

- Unique to the supplier
- Can cover things like usage variance, credit, etc.
- Could vary based on term, customer class, etc.

LDC

- Costs like pooling fees, billing fees, UFG, etc.

InterContinental Exchange (ICE)

Kill All | Activate All | Live Only | Hold Bids | Hold All | Hold Offers | Excel | Search...

Orders | Deals | Positions | Options | Market Watch | UPS | Off-Exchange | MIDCON | Gulf | East | Pacific Southwest | NYMEX | Appalachia | Midwest | West | Northeast | COH SCO | Southeast

Search... | Live Only | UPS | Hold Orders (inac

Status	CC	Product	Hub	Strip	Begin Date	End Date	RFQ	+/-	Sell	B Qty	Bid	Offer	O Qty	Buy	Last	Change	Settlement	OI	High	Low	WAP	Volume	Block Vol
	H	NG LD1 Futures	Henry	Feb19	1Feb19	28Feb19		+		2500	3.017	3.020	2500		3.017	0.073	2.944	333752	3.050	2.964	3.017	3550000	
	H	NG LD1 Futures	Henry	Mar19	1Mar19	31Mar19		+		2500	2.906	2.909	2500		2.906	0.060	2.847	359439	2.928	2.864	2.902	1242500	
	H	NG LD1 Futures	Henry	Apr19	1Apr19	30Apr19		+		2500	2.731	2.734	2500		2.732	0.053	2.677	297660	2.744	2.701	2.728	1045000	
	H	NG LD1 Futures	Henry	May19	1May19	31May19		+		2500	2.708	2.712	2500		2.710	0.048	2.662	243168	2.724	2.690	2.708	385000	
	H	NG LD1 Futures	Henry	Jun19	1Jun19	30Jun19		+		2500	2.750	2.754	2500		2.748	0.044	2.704	214617	2.766	2.731	2.753	315000	
	H	NG LD1 Futures	Henry	Jul19	1Jul19	31Jul19		+		2500	2.792	2.796	2500		2.790	0.044	2.746	213995	2.801	2.763	2.791	335000	
	H	NG LD1 Futures	Henry	Aug19	1Aug19	31Aug19		+		2500	2.790	2.794	2500		2.790	0.048	2.746	205329	2.800	2.774	2.788	205000	
	H	NG LD1 Futures	Henry	Sep19	1Sep19	30Sep19		+		2500	2.767	2.772	2500		2.767	0.049	2.723	197509	2.777	2.750	2.762	170000	
	H	NG LD1 Futures	Henry	Oct19	1Oct19	31Oct19		+		2500	2.796	2.801	2500		2.794	0.044	2.751	272073	2.805	2.774	2.793	715000	70000
	H	NG LD1 Futures	Henry	Nov19	1Nov19	30Nov19		+		2500	2.844	2.850	2500		2.842	0.045	2.802	172247	2.847	2.829	2.836	52500	
	H	NG LD1 Futures	Henry	Dec19	1Dec19	31Dec19		+		2500	2.995	3.002	2500		2.998	0.041	2.957	165076	2.998	2.985	2.996	32500	10000
	H	NG LD1 Futures	Henry	Jan20	1Jan20	31Jan20		+		5000	3.104	3.111	2500		3.104	0.037	3.068	148826	3.108	3.085	3.098	152500	60000
	H	NG LD1 Futures	Henry	Feb20	1Feb20	29Feb20		+		2500	3.029	3.040	2500		3.037	0.039	2.998	105216	3.040	3.026	3.037	40000	
	H	NG LD1 Futures	Henry	Mar20	1Mar20	31Mar20		+							2.851		2.822	111818				37500	
	H	NG LD1 Futures	Henry	Apr20	1Apr20	30Apr20		+		2500	2.534	2.567	2500		2.552		2.532	99677				22500	
	H	NG LD1 Futures	Henry	May20	1May20	31May20		+		2500	2.480				2.481	-0.001	2.482	98704	2.481	2.481	2.481	15000	
	H	NG LD1 Futures	Henry	Aug20	1Aug20	31Aug20		+							2.574		2.544	85472				15000	
	H	NG LD1 Futures	Henry	Sep20	1Sep20	30Sep20		+							2.557		2.526	87330				15000	
	H	NG LD1 Futures	Henry	Oct20	1Oct20	31Oct20		+				2.655	2500				2.548	102899				12500	
	H	NG LD1 Futures	Henry	Apr19-Oct19	1Apr19	31Oct19		+		2500	2.761	2.765	2500		2.765	0.049	2.716		2.768	2.740	2.754	80000	
	H	NG LD1 Futures	Henry	Nov19-Mar20	1Nov19	31Mar20		+		2500	2.962	2.965	2500		2.960	0.031	2.929		2.966	2.950	2.958	12500	
	H	NG LD1 Futures	Henry	Apr20-Oct20	1Apr20	31Oct20		+		2500	2.526	2.540	2500				2.526						
	H	NG LD1 Futures	Henry	Nov20-Mar21	1Nov20	31Mar21		+				2.790	5000				2.772						
	H	NG LD1 Futures	Henry	Apr21-Oct21	1Apr21	31Oct21		+		2500	2.453						2.510						
	H	NG LD1 Futures	Henry	Nov21-Mar22	1Nov21	31Mar22		+		5000	2.780						2.796						
	H	NG LD1 Futures	Henry	Nov23-Mar24	1Nov23	31Mar24		+				2.980	2500				2.895						
	H	NG LD1 Futures	Henry	Q2 19	1Apr19	30Jun19		+		2500	2.728	2.735	2500				2.681						
	H	NG LD1 Futures	Henry	Q3 19	1Jul19	30Sep19		+		2500	2.782	2.787	2500				2.739						
	H	NG LD1 Futures	Henry	Q4 19	1Oct19	31Dec19		+		2500	2.877	2.887	2500				2.837						
	H	NG LD1 Futures	Henry	Q1 20	1Jan20	31Mar20		+		2500	2.988	3.003	2500				2.962						
	H	NG LD1 Futures	Henry	Q2 20	1Apr20	30Jun20		+		2500	2.451	2.570	2500				2.508						

What is Risk

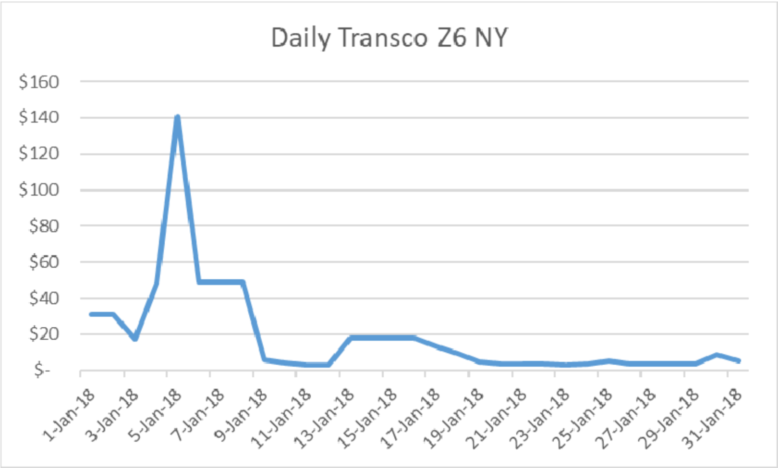
Risk *is the exposure to unpredictable expenses and revenues resulting from the change in value of an underlying asset or liability.*

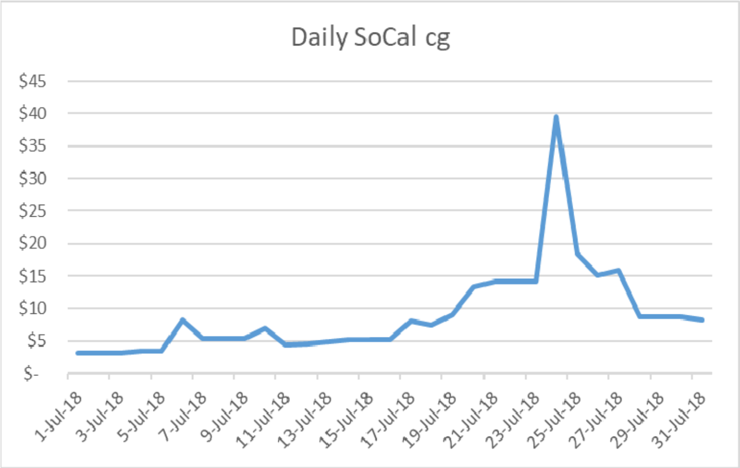
Risk Management *is the continuous process of identifying and capitalizing on appropriate opportunities while avoiding inappropriate exposure in such a way as to maximize the value of the enterprise.**

*"Risk Management and Control Programs for Energy Companies" - Arthur Anderson 12/11/1998

Primary Retail Supply Risks

- Changing commodity prices





- Changing customer usage
  - In some cases this can be managed contractually, but many times suppliers just wear this risk
  - Residential usage can change by as much as 40% over a couple of days

Main Risk Management Tools

- Usage forecasting
  - Term hedge volume
  - Usage sensitivity to weather
  - Key part of commodity and capacity planning
  - Must understand utility delivery requirements
    - Can differ by utility and customer class
- Hedging activities
  - Transacting financial hedges
  - Transacting physical gas
  - Asset utilization
  - Many times it’s a combination of all of the above

Gas Supply Process

Long

- Initial hedging exercise
- Hedge fixed price and basis exposure
- Identify assets needed to serve customer

Seasonal

- Look at seasonal weather forecast and market fundamentals
- Review storage plan
- Rebalance asset portfolio

Short

- Review utility requirements
- Review assets and positions
- If necessary, rebalance asset and supply portfolio
- Transact financial hedges as needed
- Determine least-cost method for satisfying requirements

Commodity/Capacity Planning

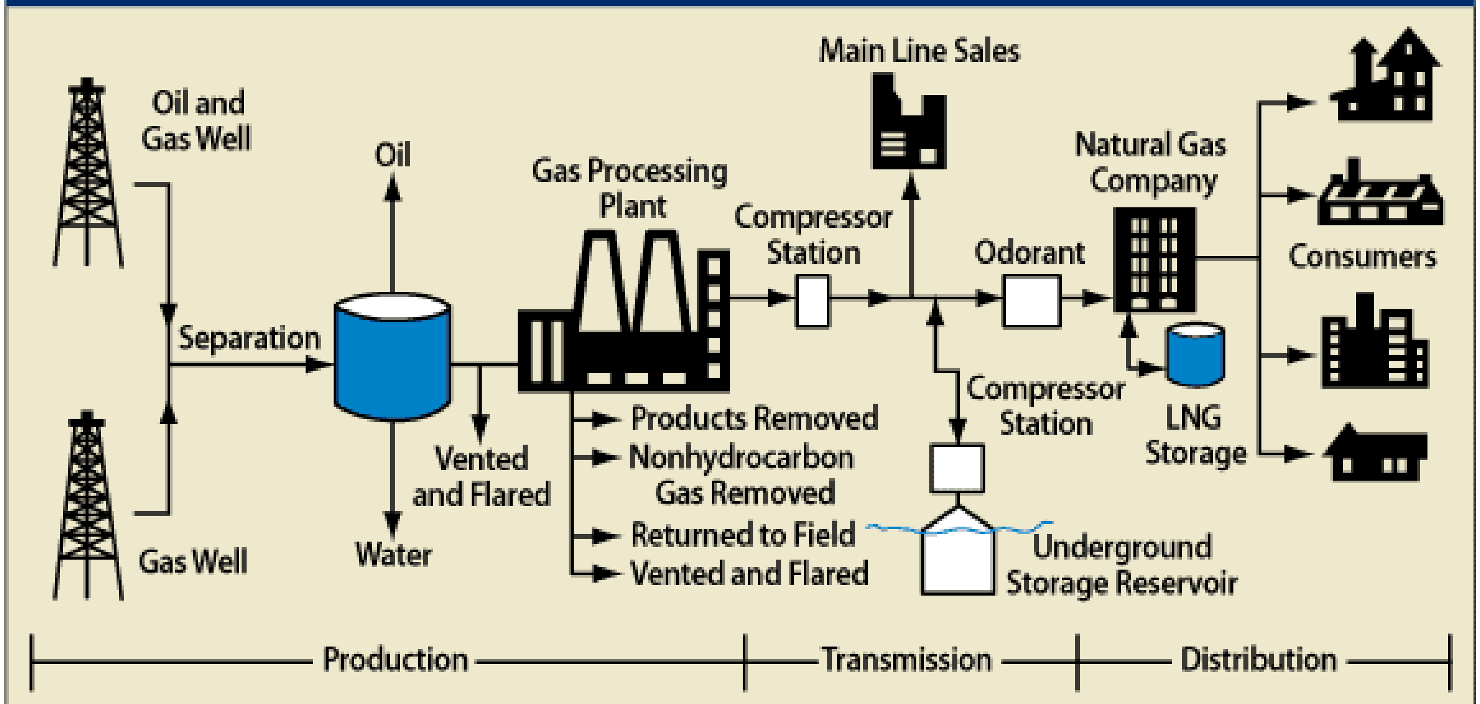
- Two main risks
  - Changing supply obligations
  - Changing market prices
- Manage having to transact in the daily market
- Look to create supply flexibility
- Market liquidity of delivered supply
- Different instruments may be used to manage supply and/or price risk
  - Financial hedges
  - Physical supply
- Done over different periods
  - Multiple months
  - Just one day

Commodity/Capacity Planning (contd.)

- What level of demand
  - Is there a comparability requirement
- Does the utility allocate capacity
- When buying capacity multiple factors need to be considered
  - Term
  - Price
  - fundamentals
- Look for optionality
  - Ability of asset to serve multiple purposes
- Do you buy primary firm, secondary firm, or interruptible
- Many suppliers will plan over 3 different terms (long, seasonal, and short)

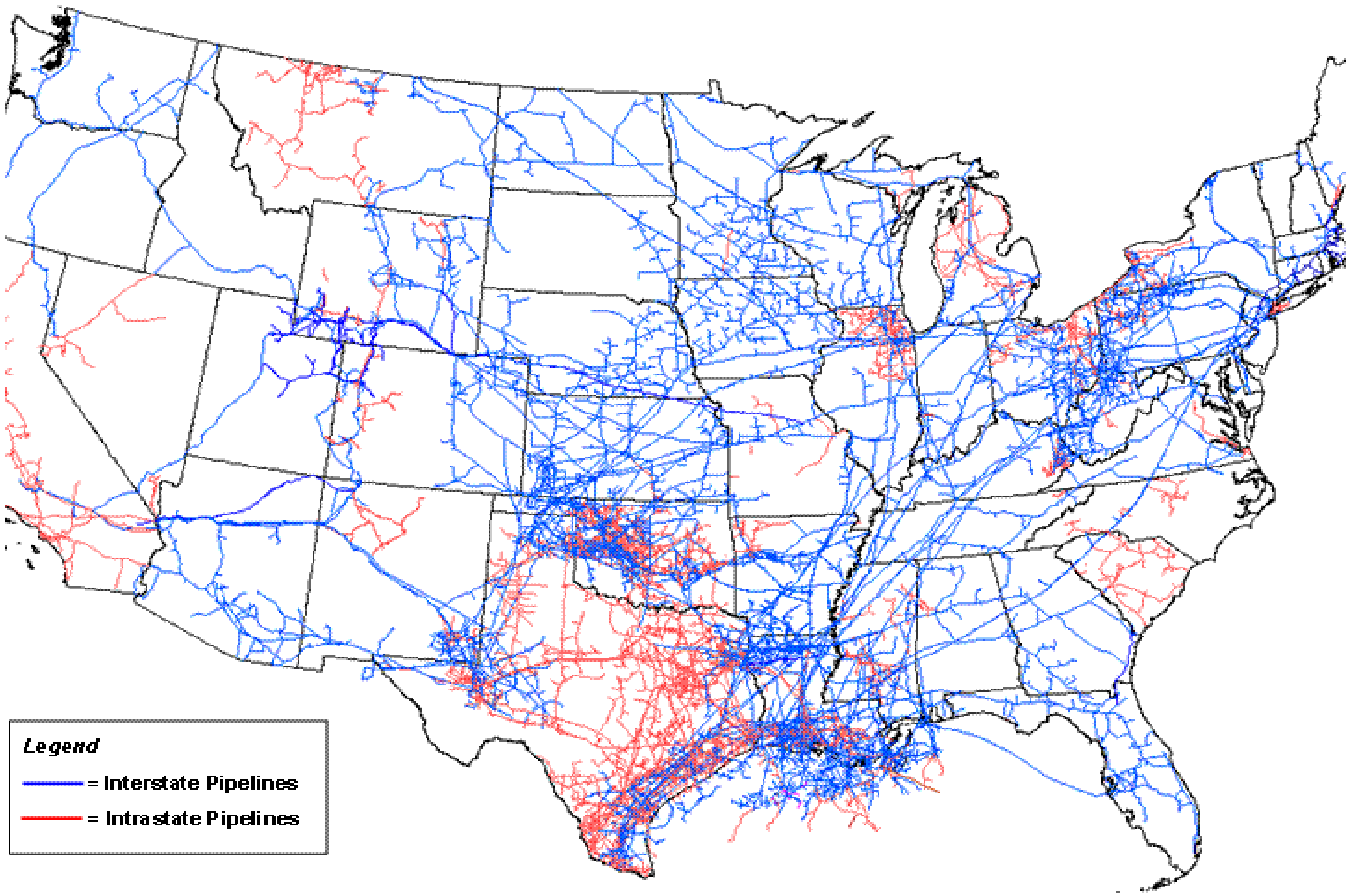
APPENDIX

The Natural Gas Production, Transmission and Distribution System



Source: U.S. Energy Information Administration.

Natural Gas Pipelines



urce: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System

Physical Markets

- Market participants are trading the actual commodity
- Major types of transactions
  - Cash (spot) – transactions for immediate delivery
    - Next day delivery
    - Balance of month
    - Intra-day
  - Forward – transactions for delivery more than one month out
- Can be bought fixed price or linked to different indices
  - Indices are either NYMEX or some regional index
- Agreed upon conditions
  - Price, volume, term, delivery point

Financial Markets

- These markets exist primarily for price discovery and risk management
- There is no transfer of physical gas
- Contracts are settled financially
- Financial pricing is often derived from physical pricing
- A variety of products are traded in these markets like futures contracts, options, and swaps
- These products are traded on established exchanges and over-the-counter (OTC) markets
  - NYMEX, ICE
- Market has moved towards more standardized products

Utility and Pipeline Interactions

Pipeline

- Open season and/or capacity release
- Managing collateral
- Issue resolution

Utilities

- Asset allocation
- Managing collateral
- Receiving delivery targets
- Issue resolution
- Program design