

Financial Hedging by Local Gas Utilities

Overview and Best Practices

NASUCA Annual Meeting
Palm Springs, California
November 14, 2016

MELISSA WHITTEN, SENIOR CONSULTANT
MWHITTEN@DAYMARKEA.COM
DIR: 617.778.2433 / CELL; 978-621-5950



Agenda

- What is Hedging: Physical vs Financial
- Why do Physical Hedging?
- Why do Financial Hedging?
- Impact of Dodd-Frank
- What Role Do Price Indices Play?
- Best Practices for Financial Hedging
- To Hedge or Not to Hedge ...

The information provided is not intended to and does not render legal, accounting, tax, or other professional advice or services, and no client relationship is established with Daymark Energy Advisors by making any information available in this presentation. None of the information contained herein should be used as a substitute for consultation with competent advisors

What is Hedging – Typical Definition

■ Are you a Risk-Averse?



■ Or a Risk-Taker?



What is Hedging?

- Hedging - Technical definitions:
 - A transaction that offsets a physical position with the intent of managing price risk.
 - The process of protecting the value of an investment from the risk of price fluctuation.
 - The long position in an underlying asset can be protected – hedged - with an offsetting short position in a related underlying instrument.
 - Likewise, a short position in an underlying asset can be offset by taking a long position in a related underlying instrument.

What is Hedging?

- Popular / simplistic definition is to say Hedging is a form of “Insurance”
- But is Hedging the *same* as Insurance? No.
- Insurance provides specific coverage against total loss (less some deductible amount).
- Hedging is related to a broader market risk and depends upon the definition of the market embedded in the contract.
- Hedging specifically considers that there is some probability that loss will occur.

Why Physical Hedging?

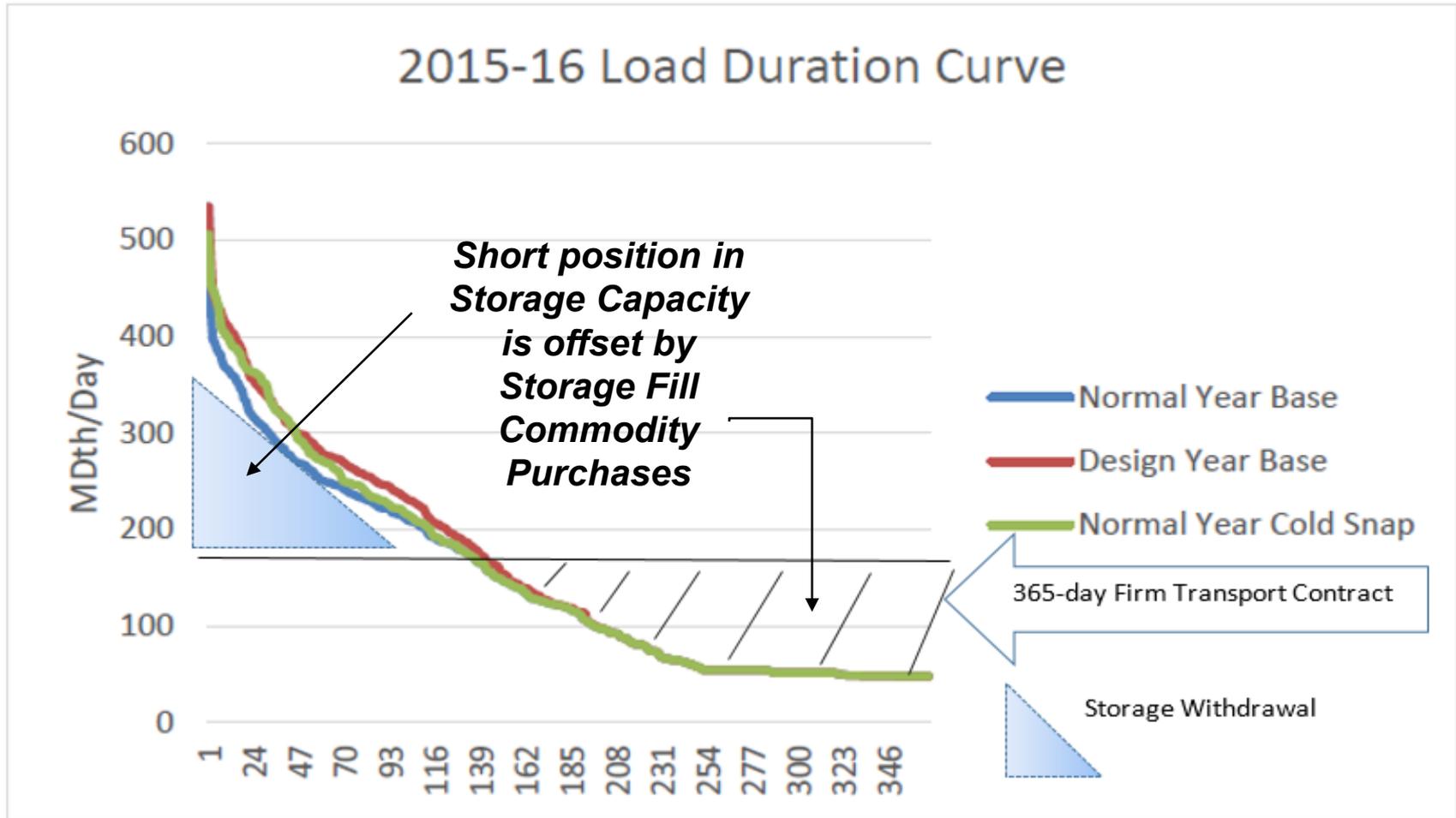
- Physical Hedging includes investment in the assets necessary to effect physical delivery.
- NGDCs starts with a short position that it needs to offset with a long position:
 - an obligation to serve customers (long demand)
and
 - short commodity to meet that demand
- NGDCs enter into various contracts to meet their obligation to serve

Why Do Physical Hedging?

- For NGDCs these physical hedge assets include:
 - Firm contracts for interstate pipeline capacity and related storage capacity
 - Ownership or firm contracts for above ground satellite storage capacity
 - Firm contracts for natural gas commodity
 - Investment in natural gas reserves
 - Asset Management Agreements (AMAs)?
- E.g., many NGDCs must cycle storage annually
 - Hold a short position in commodity at the end of winter
 - Long storage capacity under contract – based on demand (see chart below)

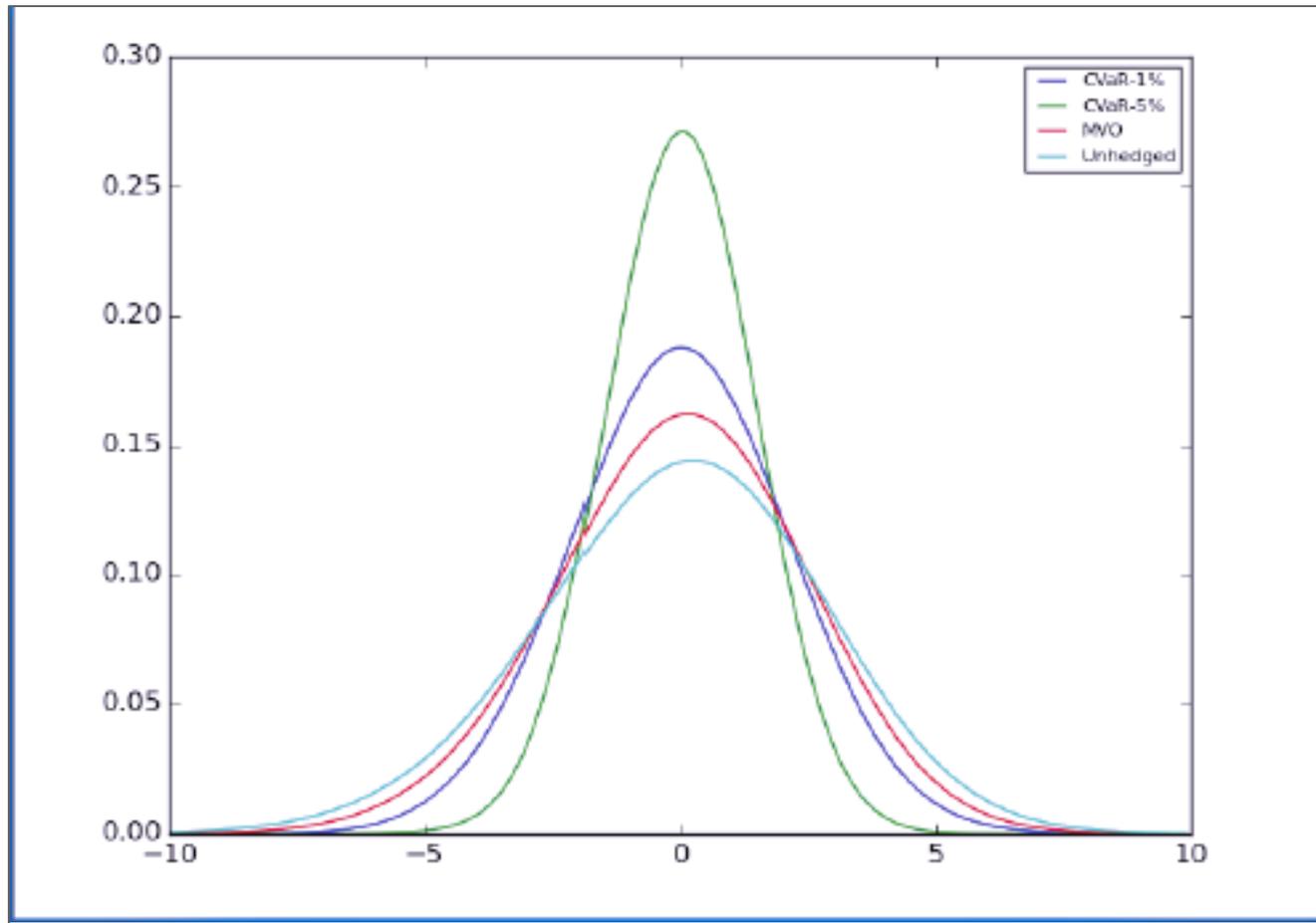
NGDC Physical Hedging Illustration

Figure III-3: 2015/16 Load Duration



Source: DPU 15-143 CMA F&SP

Why do Physical Hedging?



- Objective is to narrow the gas portfolio's range of annual cost
- [Figure 15, p. 7, http://research.axioma.com/cvar-scenario-based-framework](http://research.axioma.com/cvar-scenario-based-framework)

Why do Financial Hedging?

- Financial Hedging (as opposed to *speculation*)
 - involves entering into an transaction whose price has some acceptable correlation to the physical commodity being hedged.
 - For a volume less than or equal to an appropriate ratio to the amount of physical commodity needed.
- Speculation also occurs when correlation is $<$ target %
 - Where the target % is expected to be high
 - NGDC should provide and be able to defend the target %
- For NGDCs may consider:
 - NYMEX futures and options – exchange traded standardized contracts
 - Predominantly forward contracts – bi-lateral agreements with marketers that include terms tailored to the NGDC.

Why do Financial Hedging?

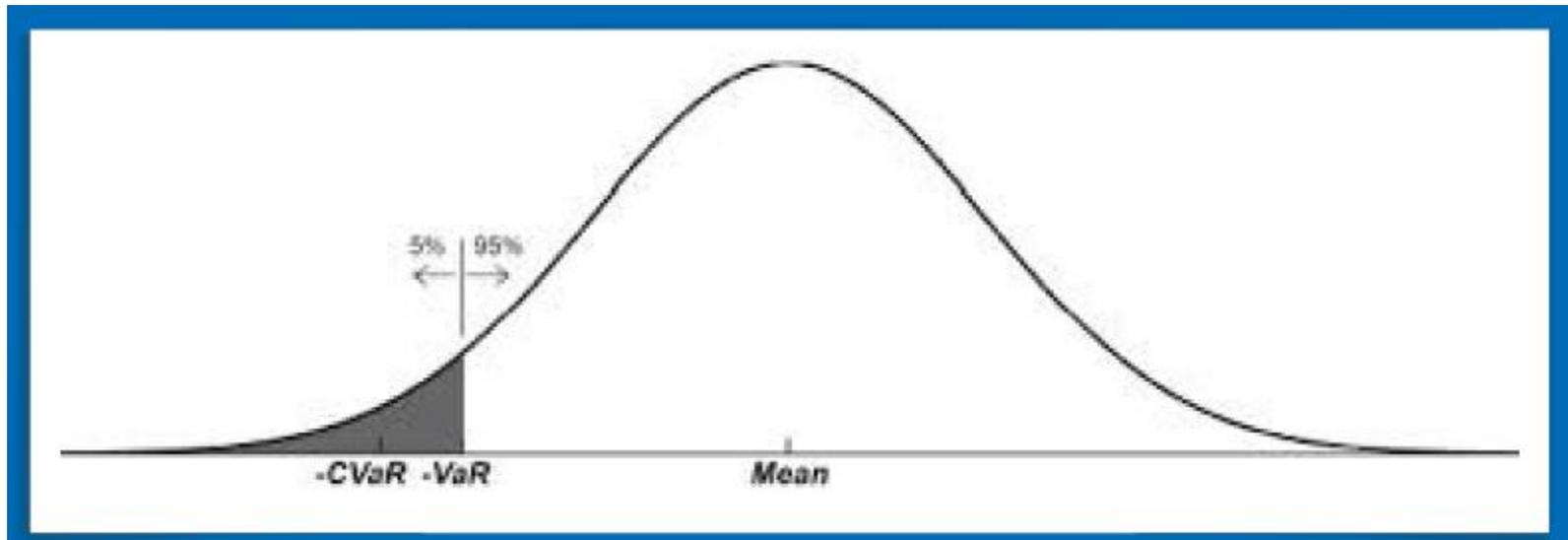
- Cost minimization without additional physical purchases.
- E.g., Agree on a contract for differences (CFD) – NGDC buys a financial contract for Algonquin (Boston) citygate delivery basis price differential (versus Henry Hub) and continues to pay spot Algonquin price for physical delivery.
- NGDC pays Spot basis for physical delivery, which increases over time after financial-only transaction price lock.
- NGDC receives a check for the difference between the \$3.00 price and spot price at the end of the contract term, i.e., a financial settlement only.

Why do Financial Hedging?

- When the physical index price is not appropriate or even available:
 - E.g., cross-commodity hedge when no liquid market exists for target commodity
 - Heat rate contract; natural gas vs diesel
- When prices appear to be at a historic low point across the futures price strip:
 - Alternative to specific risk of investing in physical reserves, which many NGDCs are considering now
 - Physical reserves have locational risk – characteristics of the wells and reservoir being accessed.

Why do Financial Hedging?

- Metric often used is Value at Risk (VaR)
- Objective to show probability of incurring higher gas costs than X (budget) is less than, e.g., 5%



- Note: conditions that can lead to the higher costs are not “Black Swan” events.

Why do Financial Hedging?

- But this illustration presumes that:
 - the budget is known for certain in advance and
 - The only metric is total budget cost
- This is not the only metric for NGDCs:
 - Many NGDCs adjust cost of gas filings monthly
 - Some jurisdictions impose a separate metric for under/over collection versus winter CGA filing
- If physical hedging capacity is adequate or seasonal arbitrage not apparent, then hedging is needed only to assure firm delivery

Physical vs Financial Hedging Instruments

	Physical	Financial	Non-Standard
Short-Term (< 1 year)	<ul style="list-style-type: none"> • Storage • Fixed-price contracts • Changes in production 	<ul style="list-style-type: none"> • Futures, swaps • Options, collars • Weather derivatives 	<ul style="list-style-type: none"> • Swing, peaking, no-notice provisions in physical contracts
Medium-Term (1-5 years)	<ul style="list-style-type: none"> • Fixed-price contracts 	<ul style="list-style-type: none"> • Futures, swaps • Options, collars 	<ul style="list-style-type: none"> • Outsourcing of physical supply portfolio • Alternative price arrangements in physical contracts <ul style="list-style-type: none"> – Caps/floors – Index Averaging, S-curves – Base prices indexed to other commodity prices
Long-Term (6+ years)	<ul style="list-style-type: none"> • Fixed-price contracts • Reserves ownership 	<ul style="list-style-type: none"> • Liquidity issues with available products 	<ul style="list-style-type: none"> • Outsourcing of physical supply portfolio • Alternative price arrangements in physical contracts <ul style="list-style-type: none"> – Caps/floors – Index Averaging, S-curves – Base prices indexed to other commodity prices

Figure 12, p. 22, <http://www.cleanskies.org/wp-content/uploads/2011/08/ManagingNGPriceVolatility.pdf>

Impact of Dodd Frank on NGDCs

- Dodd-Frank declared that existing transaction types already long in use by utilities – Swaps – must be centrally cleared
- Energy related commodity transactions prior exemption was ignored
- Utility (and other end-users) primarily use forward contracts, but these were swept up by Dodd Frank
- CFTC's role to implement Dodd-Frank is to:
 - Promote price discovery and transparency
 - Define who is a swap dealer / swap participant
 - Assure adequate margin for derivatives market

Impact of Dodd Frank on NGDCs

- Dodd Frank issued in 2010
- CFTC took until 2014 - 2016 to exclude Utility Operations-Related Swaps with “Utility Special Entities” from the need to register as a swap dealer:
- Utility Special Entity (2014):
- “Has public service obligations ... under Federal, Stat or local law or regulation to deliver electric energy or natural gas service to utility customers.”

http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/use_factsheet091714.pdf

Impact of Dodd Frank on NGDCs: Embedded Optionality

- CFTC clarified in April 2016 that certain contracts with embedded optionality are also considered customary commercial arrangements
- However, other changes may impact liquidity and increase cost of hedging:
- CFTC threshold for determining who is a swap dealer will decline from \$8 billion to \$3 billion in December 2017.
- Number of Futures Commission Merchants (FCM) has declined since 2005
- Availability of FCM, brokers upstream of marketers can affect basis quotes

What Role Do Price Indices Play?

Price indices are important for energy markets because:

- Form the basis for a Swap transaction
- Reflect differences in supply and demand:
 - Across geographic markets
 - Over time
- Are published by third party surveys according to FERC rules, including:
 - Price range, median
 - Volume traded
- NYMEX futures contract prices are based on standard contract terms and settlement prices

Best Practices for Hedging

- Is the index price appropriate?
 - Geographic location? Is it a HUB?
 - Liquid Market represented by:
 - Volume traded
 - Number of Marketer quotes – often the only factor considered.
- Does the basis differential compare favorably to the cost of daily gas management by the NGDC?
 - Don't be afraid to ask marketers for their
 - profit margin
 - monthly basis quotes
 - Activity previously traded based on that index hub price

Best Practices for Hedging

- Does the NGDC have an adequate ETRM (energy trade and risk management system) in place?
- Does the software investment offer other benefits?
 - E.g., How much has it minimized data entry error?
 - Time to process invoices, report portfolio status?
- ETRM software systems are major investments
 - Up front costs
 - Annual maintenance fees
- Many users are major energy trading firms; application not designed for NGDCs out of the box.
 - Return on investment takes time to measure

To Hedge or Not to Hedge ... Financial Hedging

- The objective of hedging is to minimize the impact of price volatility on customers – already being met?
 - Frequent Cost of Gas factor adjustments
 - If the NGDC is sitting on top of abundant supply?
 - If the NGDC is not short capacity under design conditions? i.e., is it a substitute for acquiring more physical assets?
- What other objectives are met?
- Indirect costs, e.g., liquidity, reporting requirements?
- CFDs and Call Options may make the most sense:
 - If premium is affordable
 - Less than internal staff direct cost of procurement
 - Redirect staff to monitor volume and other portfolio options

Thanks for your time !

Let's continue the conversation:

Melissa Whitten

Phone: 617.778.2433

Email: mwhitten@daymarkea.com

www.DaymarkEA.com



Impact of Dodd Frank on NGDCs

- Embedded Volumetric Optionality:
- CFTC took until April 2016 to clarify that certain contracts with embedded optionality are also considered customary commercial arrangements:
 - Certain capacity contracts in electric power markets that require load serving entities to purchase “capacity” from suppliers to provide on-demand power delivery
 - Peaking supply contracts that enable an electric utility to purchase natural gas from another natural gas provider on days when the NGDC curtails its natural gas service.
- http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/use_factsheet091714.pdf

What Role Do Price Indices Play?

- NYMEX futures contract prices are based on standard contract terms and settlement prices
- E.g. natural gas basis futures contracts are a function of both NYMEX and an Index Price:
 - “The Floating Price for each contract month will be equal to the Platts Inside FERC's Gas Market Report ("Platts IFERC") Algonquin City-gates Index ("Index") published in the first regular issue of the contract month minus the NYMEX (Henry Hub) Natural Gas Futures contract final settlement price for the corresponding contract month.”
- http://www.cmegroup.com/trading/energy/natural-gas/algonquin-citygates-natural-gas-basis-futures_contract_specifications.html

What Role Do Price Indices Play?

- Question?
- If NGDC traders avoid physical fixed price transactions (i.e., always purchase index-based deals or receive citygate delivery at daily index pricing)
- How do they know that the index price is fair?
- How do they define their “market” for gas:
 - Monthly (baseload) gas purchases
 - Daily gas purchases
- Who competes with them in each of these markets?
 - Monthly – mostly NGDCs
 - Daily – electric, gas and industrials

Best Practices for Hedging

- Does the NGDC have an adequate ETRM (energy trade and risk management system) in place?
 - Track volumes at all points along the supply chain?
 - Confirm net back pricing to supplier / marketer?
 - Enforce portfolio wide volume limits over time
 - Enforce volume limits by futures/forward contract term
 - Require master service agreements in place with qualified bidders
 - Require sign-off on transaction for price and quantity
 - Confirm within board approved limits