

# Financial Hedging by Local Gas Utilities

Overview and Best Practices

**NASUCA Annual Meeting**  
**Palm Springs, California**  
**November 14, 2016**

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# 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 ...

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# 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?

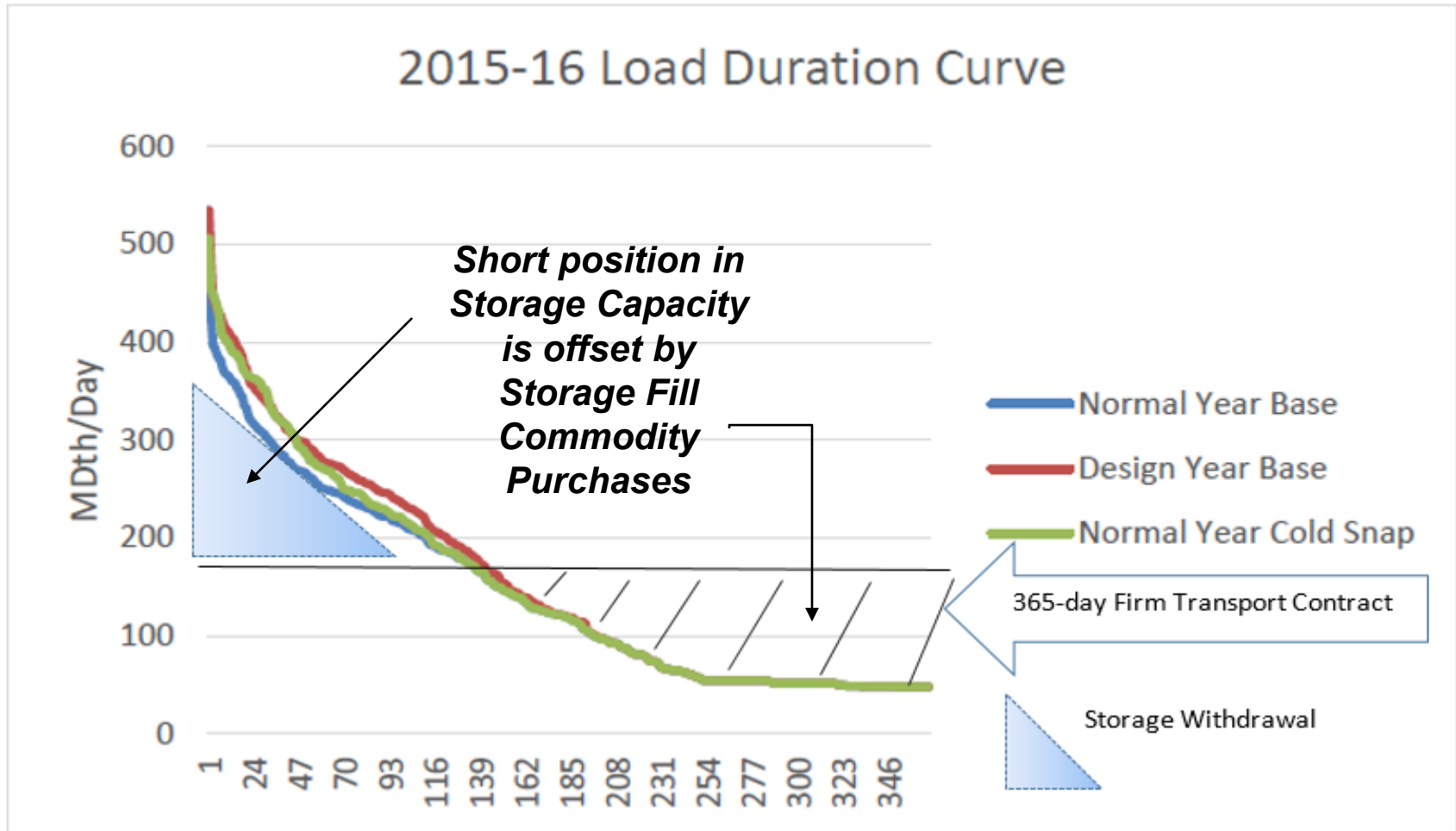
- Physical Hedging includes investment in the assets necessary to effect physical delivery.
- NGDCs starts with a short position that it needs to offset with a long position:
  - an obligation to serve customers (long demand)  
and
  - short commodity to meet that demand
- NGDCs enter into various contracts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

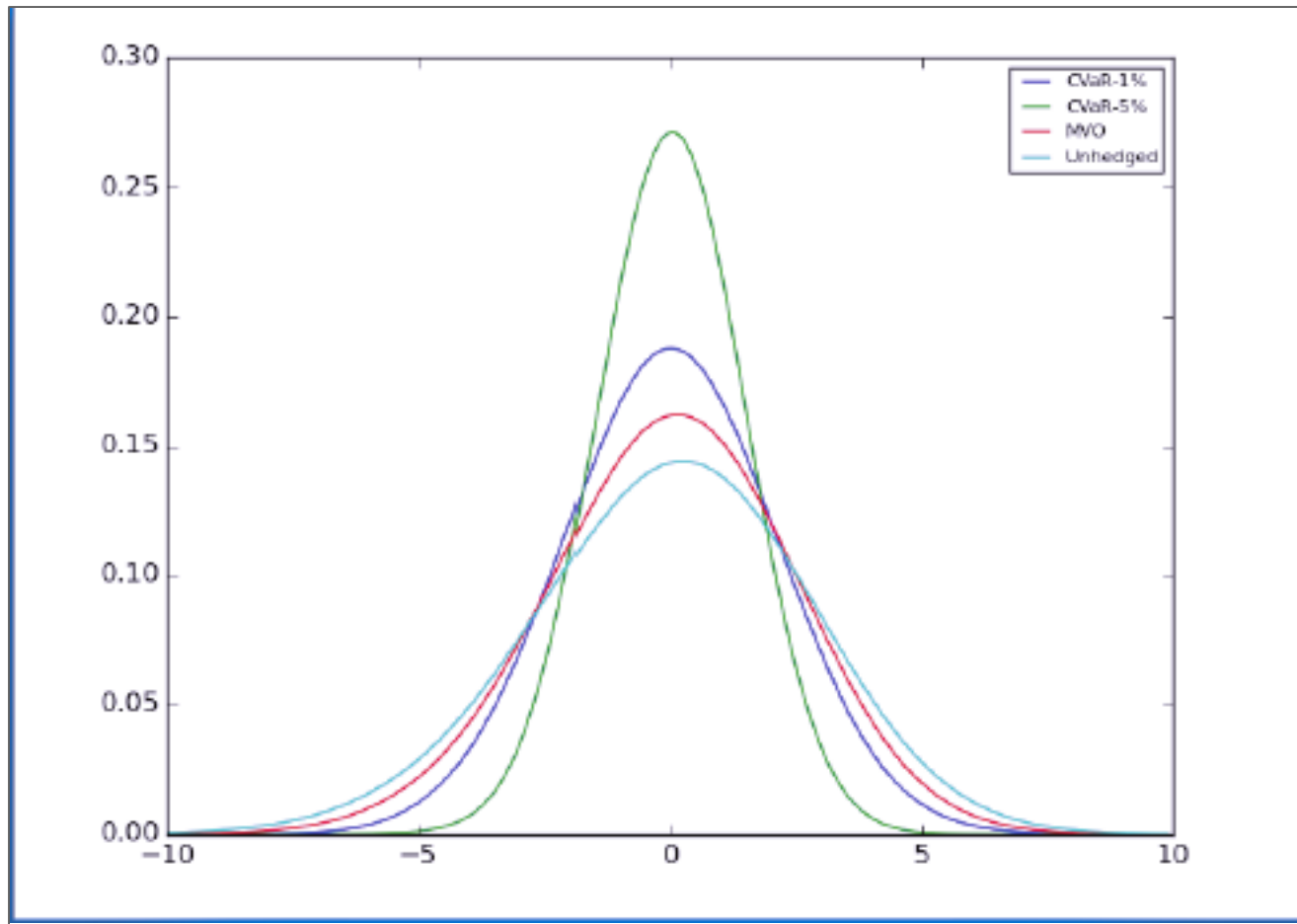
*Figure III-3: 2015/16 Load Duration Curve*



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?

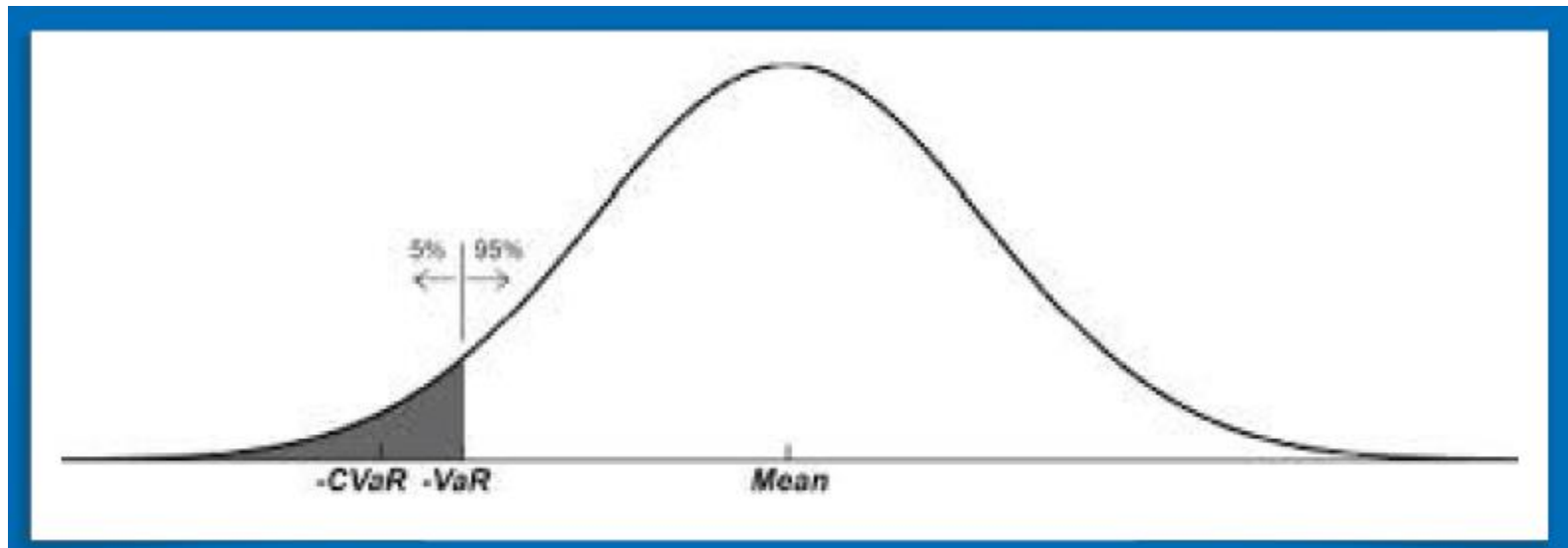
- Cost minimization without additional physical purchases.
- E.g., Agree on a contract for differences (CFD) – NGDC buys a financial contract for Algonquin (Boston) citygate delivery basis price differential (versus Henry Hub) and continues to pay spot Algonquin price for physical delivery.
- NGDC pays 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"> <li>• Storage</li> <li>• Fixed-price contracts</li> <li>• Changes in production</li> </ul>	<ul style="list-style-type: none"> <li>• Futures, swaps</li> <li>• Options, collars</li> <li>• Weather derivatives</li> </ul>	<ul style="list-style-type: none"> <li>• Swing, peaking, no-notice provisions in physical contracts</li> </ul>
Medium-Term (1-5 years)	<ul style="list-style-type: none"> <li>• Fixed-price contracts</li> </ul>	<ul style="list-style-type: none"> <li>• Futures, swaps</li> <li>• Options, collars</li> </ul>	<ul style="list-style-type: none"> <li>• Outsourcing of physical supply portfolio</li> <li>• Alternative price arrangements in physical contracts                             <ul style="list-style-type: none"> <li>– Caps/floors</li> <li>– Index Averaging, S-curves</li> <li>– Base prices indexed to other commodity prices</li> </ul> </li> </ul>
Long-Term (6+ years)	<ul style="list-style-type: none"> <li>• Fixed-price contracts</li> <li>• Reserves ownership</li> </ul>	<ul style="list-style-type: none"> <li>• Liquidity issues with available products</li> </ul>	<ul style="list-style-type: none"> <li>• Outsourcing of physical supply portfolio</li> <li>• Alternative price arrangements in physical contracts                             <ul style="list-style-type: none"> <li>– Caps/floors</li> <li>– Index Averaging, S-curves</li> <li>– Base prices indexed to other commodity prices</li> </ul> </li> </ul>

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](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:

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# 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](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](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