

GAS PROCUREMENT: APPLICATION OF THE PORTFOLIO APPROACH

The National Regulatory Research Institute

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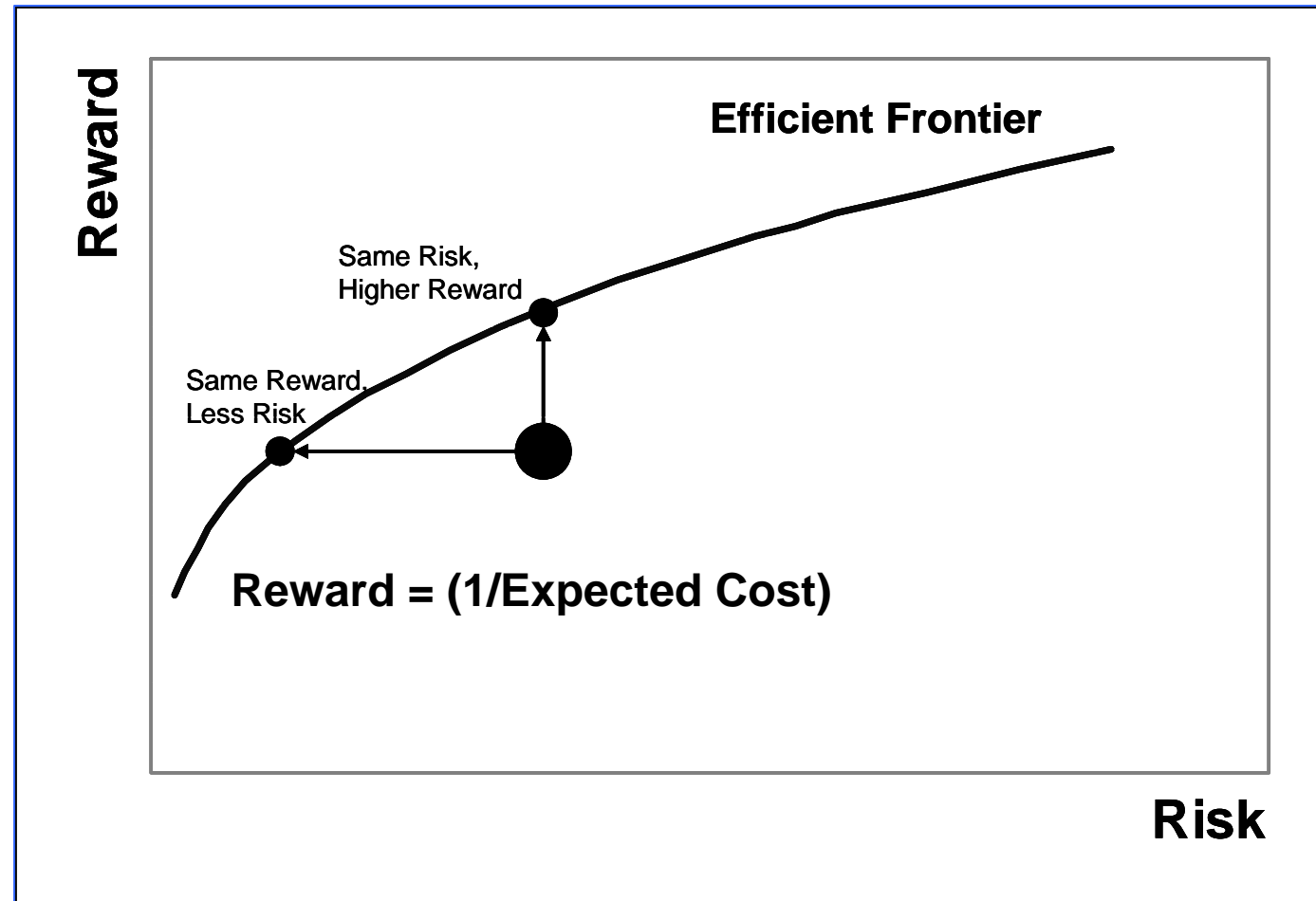
Topics

- Major considerations in a gas portfolio
- Common features of gas procurement
- Hedging
- Recent trends

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The Portfolio Approach



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A New Game For Gas Utilities Since the Early 1990s

- New responsibilities and risks with respect to
 - Commodity gas procurement
 - Interstate pipeline transportation
 - Price-risk management
- More choices of services and providers
- More transparent price information
- Availability of a wide array of financial instruments
- Recent focus on achieving a balance between minimum prices, reliable supply, and moderate price volatility

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Objectives of Gas Procurement Planning

- Reliable supplies delivered to the city gate
- Commodity and capacity costs compatible with market conditions
- Development of a portfolio to achieve “reasonable” costs to support reliability
- Balancing of “reasonable” costs and moderate price stability (and, relatedly, price predictability)

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Information Required To Develop a Gas Portfolio

- Demand
 - Annual, seasonal and peak-day forecasts
 - Load factor (average load divided by peak load, on an annualized basis)
 - Load predictability
 - Base load (constant day-to-day load, or non-weather sensitive load)
 - Swing load (changes in day-to-day load)
 - Peak load (maximum load over some time period)
 - Design day requirements (expected sales under extreme weather conditions -- the design day is a 24-hour period of demand which is used as a basis for planning gas capacity requirements)

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Information Required To Develop a Gas Portfolio -- *continued*

- Available pipeline services and rates (e.g., firm, interruptible, no-notice, released capacity)
 - For example, pipeline storage service bundled with firm transportation service; no-notice pipeline service
- Storage capability – system and off-system
- Commodity gas sources
- Spot prices – current and expected
- Contract prices and other terms and conditions for commodity gas
- Available financial instruments and their “costs”

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Role of Storage

- Lowers price volatility
- Acts as a physical hedge
- Helps meet peak winter demand
- Can reduce overall gas costs by taking advantage of seasonal price differences
- Can be used to arbitrage market opportunities (i.e., to profit from changed market conditions)

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Contracting for Commodity Gas

- Fixed price or indexed (monthly, weekly)
- Duration of contract (daily, monthly, less than 1 year, more than 1 year)
- Firmness of service
- Base, swing or peaking
 - For example, swing contracts allow the buyer to vary its take, up to a Maximum Daily Quantity (“MDQ”); they must be nominated or scheduled prior to purchase

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Contracting for Pipeline Services

- Recent concern of the decline in long-term contracts
- Pros and cons of long-term contracting (see table)
- Contracting in the context of today's gas market
- The load profile as a determinant of the mix of pipeline services
- Firmness of service
 - For example, under no-notice service, the delivery of natural gas occurs on as-needed basis, without the need to precisely specify the delivery quantity in advance
- FERC's SFV pricing regime penalizes low load-factor gas utilities by imposing (1) high fixed reservation charges, and (2) small variable commodity charges

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Reasons for Long-Term Contracting in the Economics Literature

- Assure reliability over time
- Avoid short-run demand or supply shocks, and related risk of curtailments
- Reduce the transaction costs associated with repeated spot-market purchases
- Reduce price risk when futures contracts or financial instruments are unavailable
- Protect against price increases resulting from the exercise of market power
- Increase certainty of revenues from investments

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Contracting for Long-Term Pipeline Services

Positives	Negatives
Needed for new pipeline investments	May be sub-optimal in the current gas-market environment
Reduces risk to the gas utility and its customers	Incompatible in an open and competitive market
Reduces transactions costs from repeated short-term transactions	Risks to customers from over-commitment by a utility

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The Spot Or Cash Market

- Definition: the market for a cash commodity where the actual physical product is traded
- Examples: day-ahead, monthly gas transactions
- Low-transaction-cost auction market
- Prices determined by supply and demand – but because of storage, at the market-determined spot price production is not equal to demand
- Spot price is determined by several factors: (1) production cost, (2) storage levels, (3) economic conditions, (4) weather, (5) pipeline capacity, and (6) random shocks

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The Spot Or Cash Market --

continued

- Inherently volatile and unpredictable prices
- Consequently, demand by market participants for alternative transaction and risk management mechanisms (e.g., bilateral contracting, storage, vertical integration, financial derivatives)
- Requirement of open access to the delivery network
- The spot price is used as a reference price in bilateral gas supply contracts

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The Spot Or Cash Market --

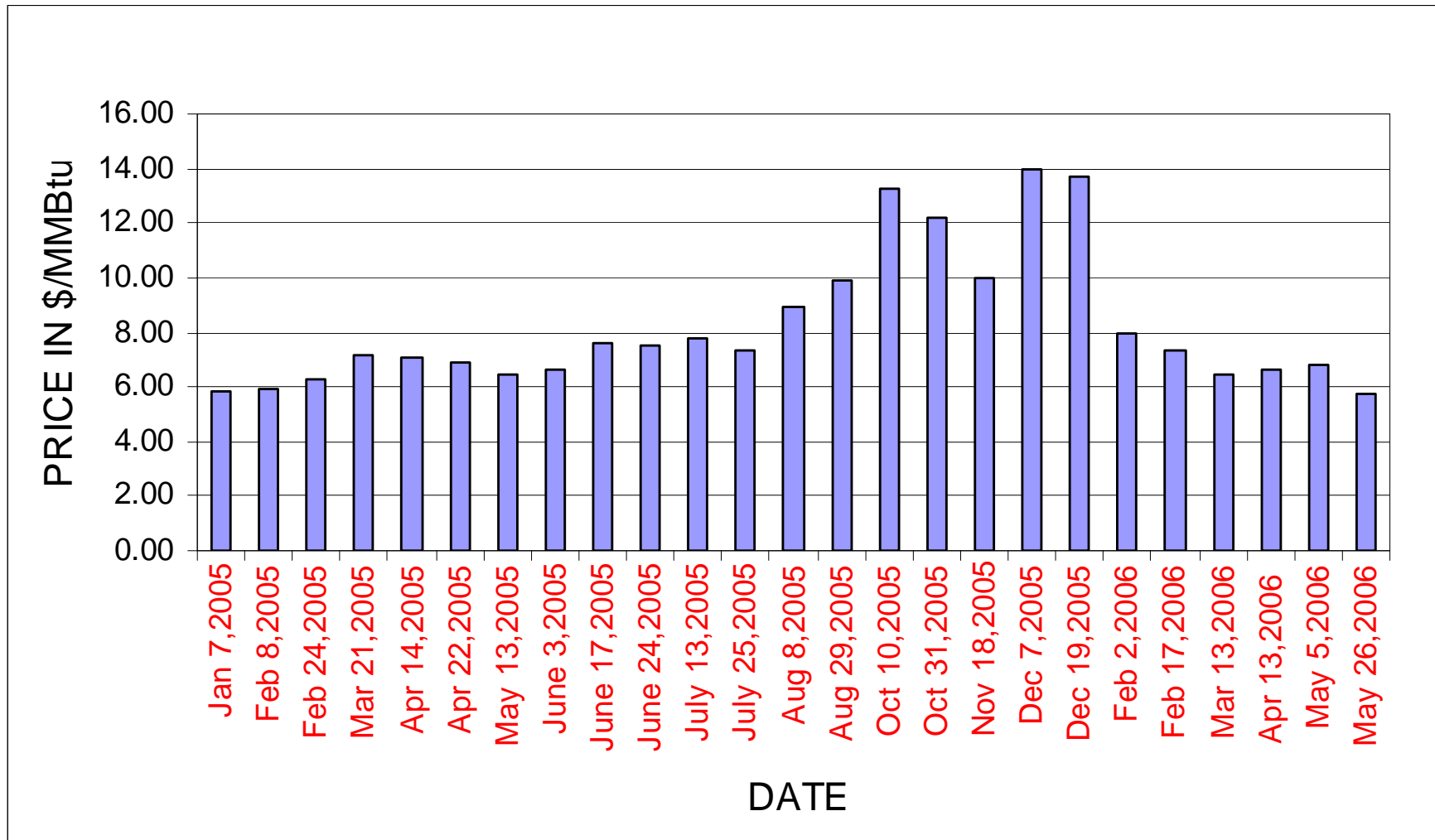
continued

- Spot market as a prerequisite for a futures and options market and the trading of other financial instruments
- Effect of a well-functioning spot market on contracting
 - Shorter-term contracts
 - Indexing of the contract price to the spot price
 - Termination of contracts on short notice

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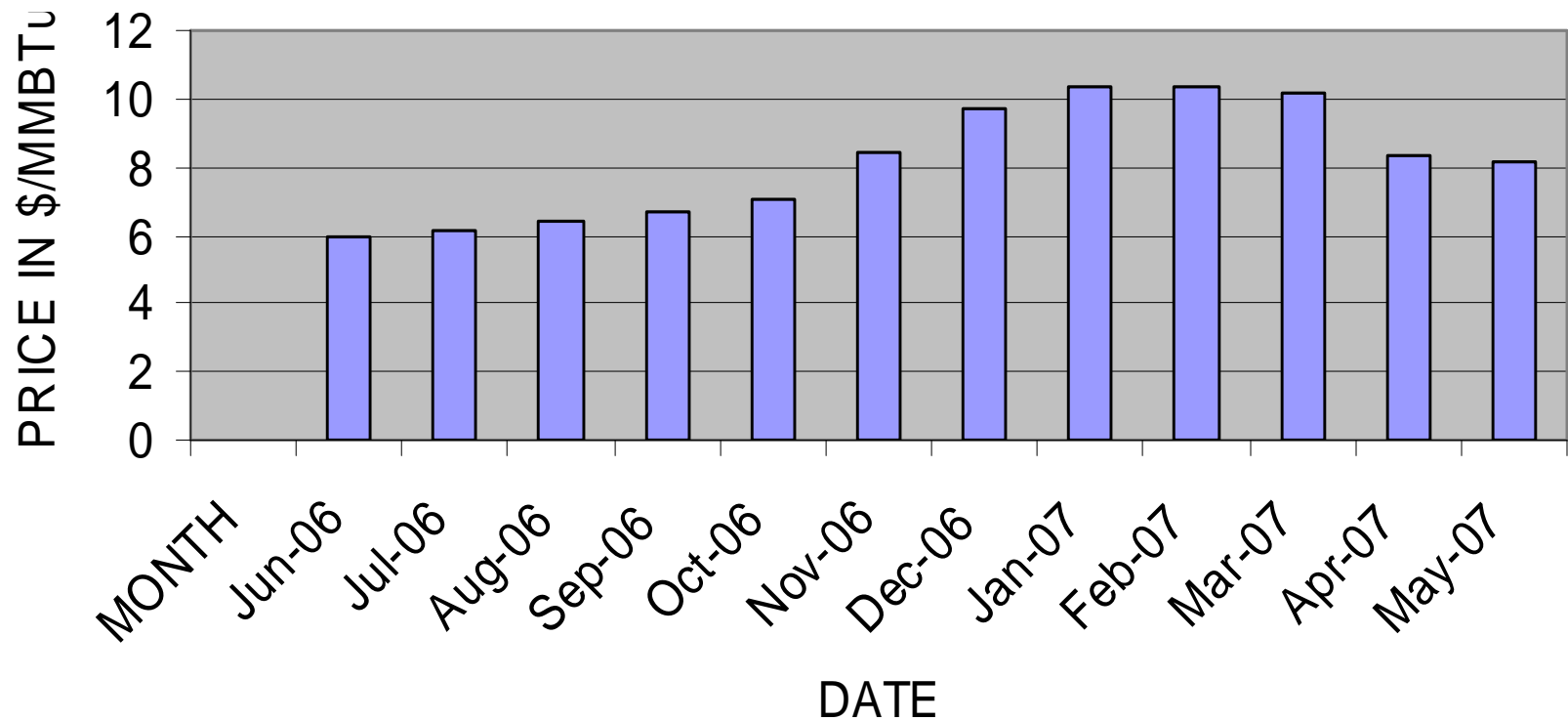


Henry Hub Prices, January 2005 – May 2006



NYMEX Futures Prices

NYMEX GAS FUTURES PRICES, as of May 26, 2006



Hedging Component

- Physical hedges
 - Storage
 - Physical contracts
- Financial hedges
 - Futures/options
 - Over-the-counter/bilateral financial instruments
- Each hedging option has advantages and disadvantages
- Likely long-term tradeoff between achieving more price stability and lower gas costs

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Hedging -- *continued*

- Hedging within the context of a utility's gas procurement portfolio
 - Reliable supplies delivered to the city gate
 - Commodity and capacity costs compatible with market conditions
 - Development of a portfolio to achieve “reasonable” costs to support reliability
 - Balancing of “reasonable” costs and moderate price stability (as well as price predictability)

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Hedging -- *continued*

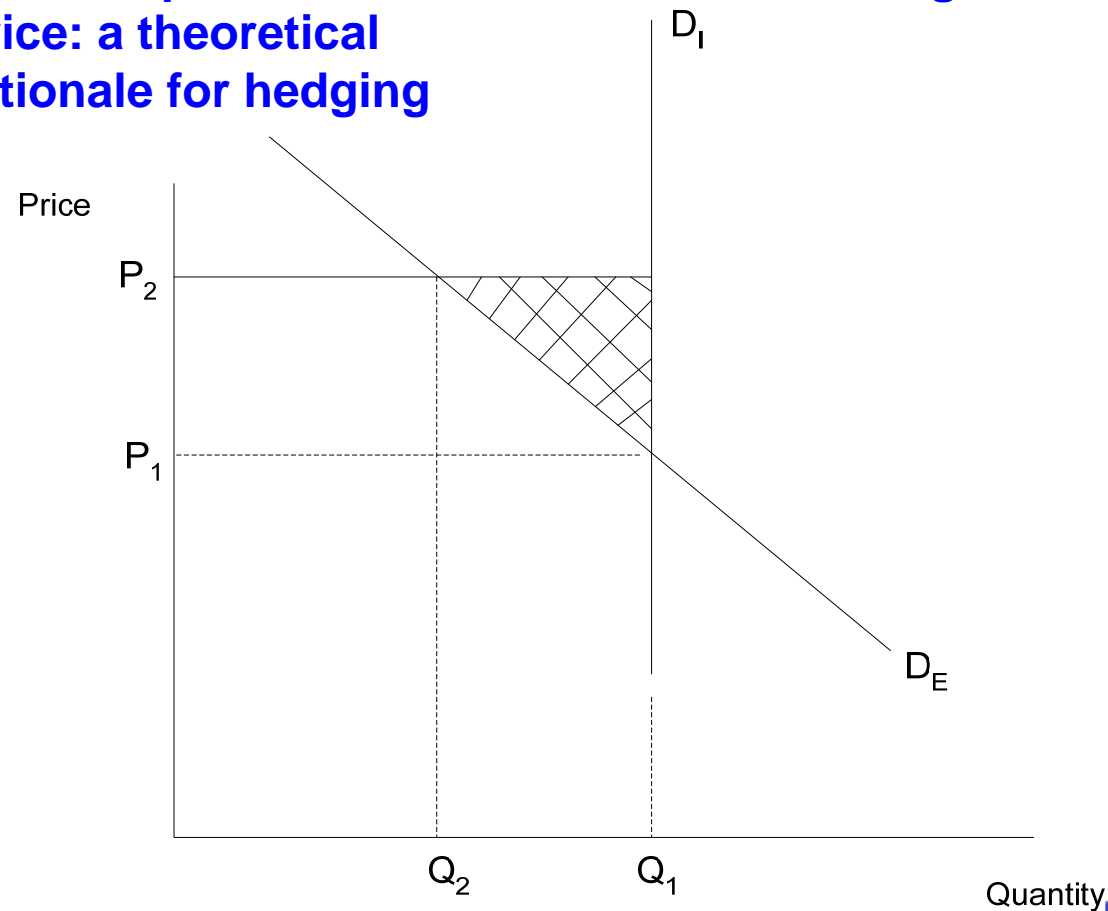
- High natural-gas price volatility, along with the vulnerability of small gas customers to high gas prices, supports an active hedging program by gas utilities, including with financial instruments (which may have lower costs and more liquidity than physical hedges).
- Since the 2000-2001 winter, state commissions have conveyed to gas utilities that
 - Buying gas at the market or spot price, in the absence of hedging protection, may no longer be acceptable (i.e., may be “imprudent”), and
 - Price stability should be an explicit goal of gas procurement

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Hedging -- *continued*

The cross-hatched area represents the additional economic welfare loss to a price-inelastic customer from a higher price: a theoretical rationale for hedging



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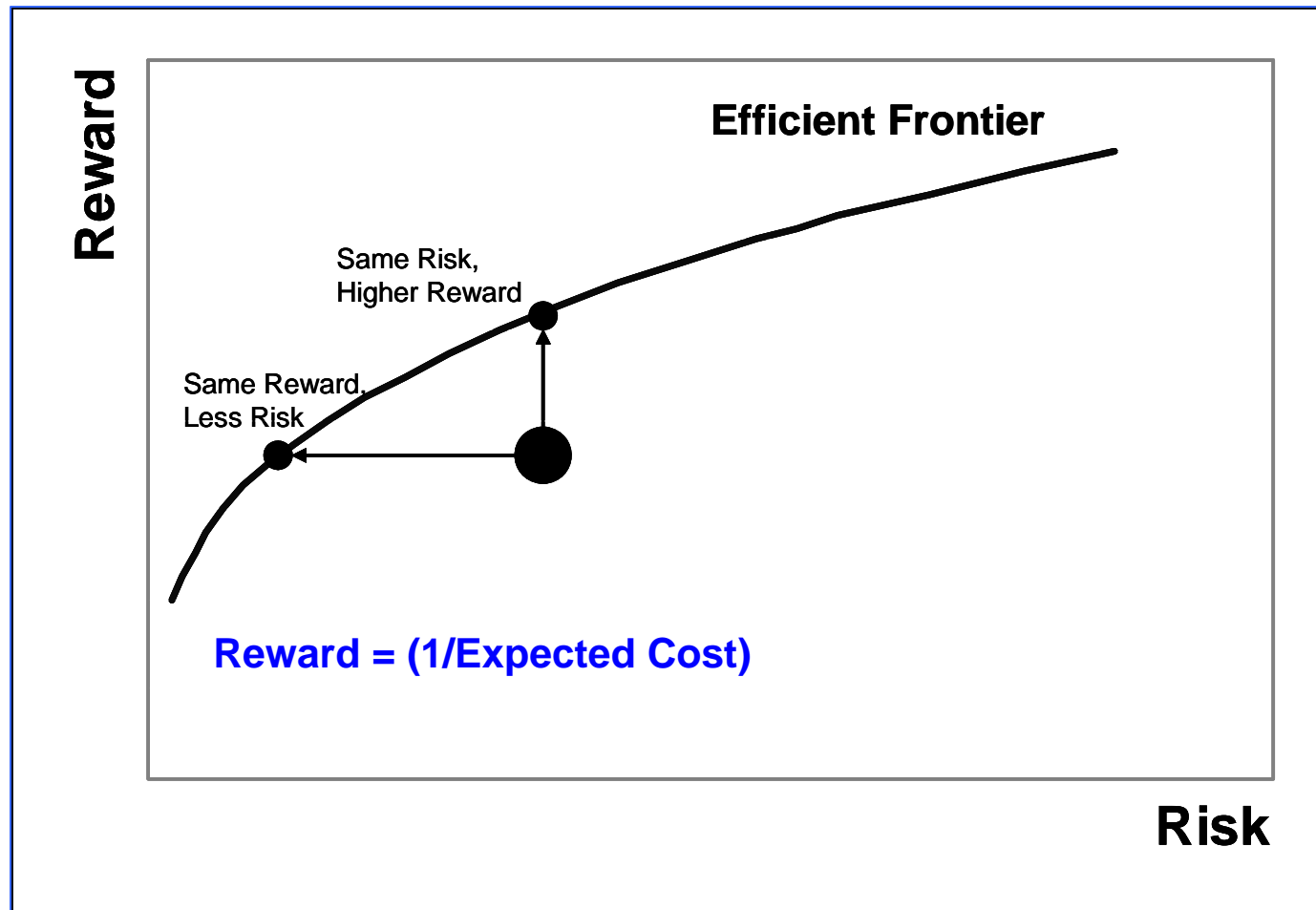
Hedging -- *continued*

- State commissions vary in their involvement (both upfront and after-the-fact) in hedging activities
- State commissions still seem more comfortable with physical hedges than with financial hedges
- Most state commissions allow hedging, including financial instruments, and some are even encouraging it
- So far, gas utilities have rarely been penalized for hedging, but the lack of regulatory guidance arguably has discouraged some from hedging efficiently or at least cost and at greater levels

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Hedging -- *continued*



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Hedging -- *continued*

- Typically, hedging to stabilize prices involves a cost to consumers or other gas purchasers (no “free lunch”); the pertinent question then becomes:
 - ***How much should a gas utility pay to have more stable prices?***
- The answer to that question largely depends upon *how much customers are willing to pay to have more stable prices or to avoid price spikes.*
- What are the utility’s incentives for hedging?

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Illustrations of a Portfolio

- Utility X
 - Purchase of fixed-price contracts for price stability
 - Purchase of indexed contracts for the winter months
 - Purchase of monthly and daily spot gas to displace more expensive swing transactions, fill summer load, and cover shortfalls

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Illustrations of a Portfolio -- *continued*

- Utility Y
 - Storage meeting one-third of winter demand
 - Physical contracts meeting another third
 - Spot transactions meeting the last third
 - Financial hedging covering a portion of spot purchases

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Illustrations of a Portfolio -- *continued*

- Utility Z
 - Storage meeting 70% of the winter requirements
 - Remainder met by long-term contracts indexed to regional spot prices
 - No financial instruments
 - No spot purchases

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Common Features of Gas Procurement Strategies

- Portfolio of supply, storage and transportation services that includes a diverse set of contractual arrangements to satisfy expected peak-day and peak-month gas requirements
- Firm transportation delivers much of the gas during peak periods
- First-of-the-month index pricing is common for long- and mid-term supply agreements

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Common Features of Gas Procurement Strategies -- *continued*

- Some financial instruments used to hedge a portion of gas supplies for the winter season
- Financial instruments purchased on a staggered basis
- Hedging strategies typically have a time horizon of less than 12 months
- Storage is the primary hedging option
- Storage also increasingly used to support parking, loaning and balancing

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Common Features of Gas Procurement Strategies -- *continued*

- Reliance on long-term agreements to procure gas on a peak day
- Use of a portfolio approach for
 - Pricing gas supplies (e.g., monthly index, daily index, contracts)
 - Procuring gas supplies and transportation (e.g., reliance on different gas sources and pipelines, under various contractual arrangements)

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Noticeable Trends in Gas Procurement

- Price stability and predictability as an explicit objective
- Increased use of financial instruments for hedging
- Shorter-term pipeline service transactions
- Movement away from multi-year commodity gas transactions
- Competitive bidding process for procuring gas supplies
- Submittal of annual gas supply plans for commission review
 - For example, plans that identify the appropriate supply and pipeline services to serve sales customers compatible with both corporate and regulatory goals, rules and guidelines

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