Commodity Hedging Workshop

General Purpose

- Overview of why we hedge (price volatility)
- Discussion of various hedge tools
- Review current commodity hedge program
- Discuss enhancements to current hedge plan
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Overall Objective

- Solicit feedback/comments from customer group
- Ensure stakeholders/customers appreciate market risks
- Consider feedback into hedging strategy
- Propose extension of hedge plan with customer input
- Seek regulatory approval of hedge program in 2008
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What is hedging?

Defined as: “to enter into transactions that will protect against loss through a compensatory price movement

Hedging:

- Reduces exposure to normal commodity price volatility
- Can act to stabilize costs (in our case, fuel costs)
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APS and Commodity Hedging

- Nuclear and coal prices historically hedged (fixed price contracts)
- Initiated commodity hedge program for natural gas and purchased power in late 1990’s
- Concerns related to impact of price volatility to customers
- Prefers commodity hedge approach with minimal risk
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Liberty Group Fuel Audit Process

- Spring/Summer 2006

- Review of fuel procurement methods and decisions
  - Included assessment of energy risk management functions

- Audit of Organizational structures, staffing, and responsibilities

- Thorough assessment of various fuel related policies, procedures, computer systems and decision making tools.
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Liberty Group Fuel Audit Results

- “APS has designed and operates a sound hedging program”

- “The Company's Energy Risk Management Guidelines and Procedures and its administration of its risk management program are as strong as any that Liberty has examined.”

- “Liberty found the capabilities of the systems and staff involved in hedging to be strengths”
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Liberty Group Audit Recommendation – August 6, 2006

- Engage stakeholders in a discussion of hedging program objectives
- Establish ways to explore the needs, expectations, concerns, values, and preference of customer groups.
- Rationalize (if possible) customer expectations and concerns
- Provide report to the Arizona Corporation Commission
Why Hedge?

- Reduce customer exposure to market price volatility (**OBJECTIVE**)
- Limit exposure to significant pricing events (**EXPECTATION**)
- Establish “predictable” range of fuels costs (**VALUE**)
- Systematic, well defined hedge strategy (**A PLAN**)

Recent Commodity Price Volatility

Calendar 2005 - 2007
This is volatility!

Palo Verde
Day Ahead On Peak Pricing
Calendar 2000/2001

Date
($)\text{MW-h}

$0 $100 $200 $300 $400 $500 $600


How is a Hedge Plan developed?

- Exposure to price volatility is measured

- “Do we have the tools to manage”
  - Procurement sources/ market liquidity
  - Personnel
  - Risk Controls/ Credit/Contracts
  - Credit – financial strength to carry out
  - Modeling tools
What do you hedge with?

Financial Contracts
- NYMEX (New York Mercantile Exchange)
- ICE (Web-based trading platform)
- Over the counter
- Highly liquid

Physical Contracts
- Typically between producer of commodity and buyer
- Entails delivery obligation

Financial or Physical Options
- Less price certainty = higher risk
- Physical options not liquid
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**Commodities Hedged by Others**
- US Dollar
- Gold
- Orange Juice
- Crude Oil
- Corn

**Commodities Hedged by APS**
- Natural Gas
- Electricity
Implied Price Volatility*
March 2007

Prompt (next) Month Price Volatilities

- US Dollar: 5% to 7%
- Gold: 10% to 15%
- Orange Juice: 25% to 30%
- Crude Oil: 30% to 40%
- Corn: 35% to 45%
- Natural Gas: 40% to 60%

*Implied price volatility refers to the expected change in price based on the relationship between the value of option premiums and the underlying product
APS Hedging Program

**Hedge Strategy**
- Historically hedged gas/power since late 1990’s
- Intent is to reduce price volatility

**Current Hedge Plan**
- Systematic hedge approach **three years forward**
- Lowest volatility risk near term (forward 12 months)
- **Required compliance dates**
- **No market speculation**
- Combined natural gas and purchased power
Effect of Hedge: 2005

APS System Hedge Report
Comparison of Hedge Costs to Market
2005

* Based on 10/30/05 Budget Fuel and Purchased Power Volumes
Effect of Hedge: 2007

APS System Hedge Report
Comparison of Hedged Costs to Market Costs
2007

$\text{(Million)}$

* Based on budget fuel and purchased power volumes
Historical Illustration of Hedge Impact
Based on 85% of Commodity Hedged

Cost Distribution - with Hedges
Cost Distribution - Unhedged
APS Hedging Program

Current Hedge Plan Specifics

- Rolling three years forward
- 85% of price risk hedged in Year One
- 50%-60% in Year Two
- 30%-40% in Year Three
- Natural gas basis risk hedged
- Compliance independently monitored

Proposal to extend to five years
Why a Five Year Hedge Plan?

Energy Needs Continue to Grow
Why a Five Year Hedge Plan?

Increased Exposure to Natural Gas Pricing
Why a Five Year Hedge Plan?

Global Natural Gas Issues

- Strong demand in China and Japan
- European growth – reliance on Russia and LNG
- Reduced Canadian Imports – coal tar sands
- LNG – future source with supply uncertainty
  - Costa Azul – likely limited supplies until 2010
- General decline in US conventional supplies outside of Colorado and Wyoming (Rockies)
- World’s long term supply in Russia and Middle East
Proposed Five Year Hedge Plan

Five Year Hedge Plan Proposal

- Rolling five years forward
- 85% of price risk hedged in Year One
- 50%-60% in Year Two
- 30%-40% in Year Three
- 15% to 25% in Year Four
- 5% to 15% in Year Five
- Required compliance deadlines
- No market speculation
Will the market be sufficient to expand to a five year plan?

Market liquidity vastly improved
- NYMEX transacts through 2013
- ICE: trades five years forward
- OTC = limited only by credit
- Influx of banking institutions
- Electricity = moving fast to financial
Will credit be adequate if we expand to a five year plan?

Market Credit is Viable

- Over 150 financial/physical counterparties
- Most with higher credit ratings that APS
- Many with five year tenor
- Constant review for changes
Risks Associated With Hedging

Uncertainty of Customer Load

- Changes in customer load growth
- Effects of demand side management programs and customer conservation
- Changes in demand due to technology
  - Increase or decrease?
  - Plasma screen vs. efficient air conditioning?
Risks Associated With Hedging

Credit/Collateral

- Current collateral requirements are based on sustained/improved credit.
- Move from three to five years does not significantly increase collateral risk based on current credit rating.
- Ability to effectively implement hedge plan is dependent on APS financial status.
  - Credit rating
  - Liquidity to support collateral arrangements
  - Predictability of cost recovery
Summary

- Purpose of hedging is to reduce price volatility
- Natural gas/purchased power needs expected to increase
- Natural gas volatility likely to remain high
- Extension to five years helps provide more stable prices to customers
- Regulatory approval of change to hedge plan necessary
- *We need your feedback!*