# Discussion Regarding Risk Tolerance

**Power Task Force**
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## Hedging

Hedging is a rational device to deter price spiking, like insurance against major catastrophic losses. It is a risk management device applied to assure steady pricing and the availability of a reliable supply at **reasonable** prices.

As it is equated to the purchase of an insurance policy and as typical with an insurance policy, over the long term, the **costs are usual higher than the spot market prices.**

For the purposes of the energy supply for CAP it is defined as the **"forward purchase of physical electricity"** in an effort to minimize the exposure to volatile energy prices.

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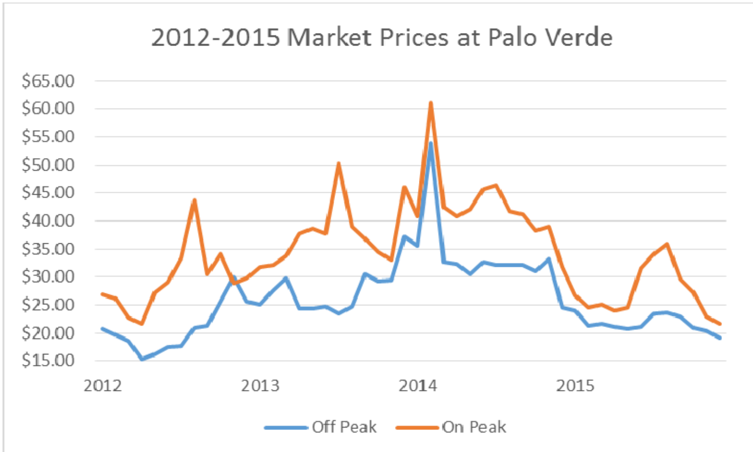
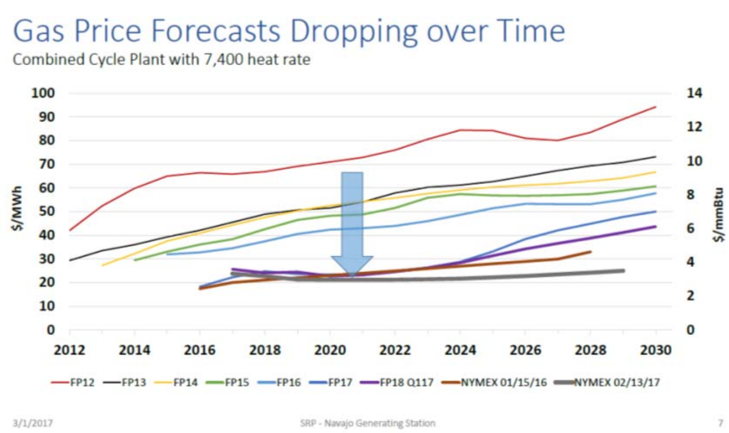
## Review of Historical Trends






## SRP's Historical Projections of Prices



## Hedging Considerations for CAP

- There are infinite strategies to hedge the CAP load
- Hedging is independent of current/future market conditions
- In the following samples
  - Market purchases are 0-3 years and referred to as blocks
  - All other purchases are greater than 3 years and referred to as strips



## Hedging Considerations

Considerations for sample portfolios:

- Base Load
  - Hedge the majority of the load
  - Hedge with longer-term strips to provide stability
  - Stagger the terms of the strips to smooth transitions
  - Ensure hedges consider the CAP rate-making process
- Variable Load
  - Hedge a minimal amount of the load since CAP is able to schedule the load during lower priced time periods
  - CAWCD currently trades on a daily basis and has the processes and ability to react to price variability on a near instantaneous basis
  - If hedged:
    - The majority of the hedges should be short term
    - Future water shortages will greatly impact this load

# Sample – Base Load 100% Hedged

| BASE LOAD SAMPLE PORTFOLIO - 100 % HEDGED | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual MWh (000) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | .... |
| 2,750 | VARIABLE LOAD | | | | | | | | | | | | | |
| 2,500 | | | | | | | | | | | | | | |
| 2,250 | | | | | | | | | | | | | | |
| 2,000 | | | | | | | | | | | | | | |
| 1,750 | | | | | | | | | | | | | | |
| 1,500 | | | | | | | | | | | | | | |
| 1,250 | | | | | | | | | | | | | | |
| 1,000 | 3 Year Forward | | | 4 Year PPA - Cost Plus Fuel | | | | 10 Year PPA - Cost Plus Fuel | | | | | | |
| 750 | 2 Year Forward | | 2 Year Forward | | Forward | Forward | 2 Year Forward | | 2 Year Forward | | 2 Year Forward | | Forward | |
| 500 | 25 Year PPA | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | | |

| |
|---|
| Forward Purchase |
| PPA - Cost Plus Fuel |



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# Sample – Variable Load 100% Hedged

| VARIABLE LOAD SAMPLE PORTFOLIO - 100 % HEDGED | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual MWh (000) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | .... |
| | | | | | | | | | | | | | | |
| 2,750 | Forward | 3 Year Forward | | | 2 Year Forward | | 2 Year Forward | | Forward | Forward | 3 Year Forward | | | |
| 2,500 | | | | | | | | | | | | | | |
| 2,250 | 3 Year PPA - Cost Plus Fuel | | | 4 Year PPA - Cost Plus Fuel | | | | 5 Year PPA - Cost Plus Fuel | | | | | Forward | |
| 2,000 | | | | | | | | | | | | | | |
| 1,750 | 3 Year PPA - Cost Plus Fuel | | | 5 Year PPA - Cost Plus Fuel | | | | | 3 Year PPA - Cost Plus Fuel | | | 6 Year PPA - Cost Plus Fuel | | |
| 1,500 | PPA - Cost Plus Fuel | | | | | | | Forward | PPA - Cost Plus Fuel | | | | Forward | |
| 1,250 | 25 Year PPA | | | | | | | | | | | | | |
| 1,000 | Base Load | | | | | | | | | | | | | |
| 750 | | | | | | | | | | | | | | |
| 500 | | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | | |

This is a 100% Hedged bookend to demonstrate a possible outcome - it is supplied to provide a visual example of the interactions/possibilities between the different forms of Agreements.

| |
|---|
| Forward Purchase |
| PPA - Cost Plus Fuel |



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## Sample – No Hedging

BASE LOAD SAMPLE PORTFOLIO - 0 % HEDGED

| Annual MWh (000) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | .... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,750 | | | | | | | | | | | | | | |
| 2,500 | | | | | | | | | | | | | | |
| 2,250 | | | | | | | | | | | | | | |
| 2,000 | Variable Load | | | | | | | | | | | | | |
| 1,750 | | | | | | | | | | | | | | |
| 1,500 | | | | | | | | | | | | | | |
| 1,250 | | | | | | | | | | | | | | |
| 1,000 | | | | | | | | | | | | | | |
| 750 | | | | | | | | | | | | | | |
| 500 | Spot Market | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | | |

VARIABLE LOAD SAMPLE PORTFOLIO - 0 % HEDGED

| Annual MWh (000) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | .... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,750 | | | | | | | | | | | | | | |
| 2,500 | | | | | | | | | | | | | | |
| 2,250 | | | | | | | | | | | | | | |
| 2,000 | Spot Market | | | | | | | | | | | | | |
| 1,750 | | | | | | | | | | | | | | |
| 1,500 | | | | | | | | | | | | | | |
| 1,250 | | | | | | | | | | | | | | |
| 1,000 | | | | | | | | | | | | | | |
| 750 | | | | | | | | | | | | | | |
| 500 | Base Load | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | | |

This is a 0% Hedged bookend to demonstrate a possible outcome.

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## Post-NGS Power Strategy

CAP will assemble a diversified energy portfolio using the following criteria

- Diversification reduces overall risk and promotes price stability, especially during periods of uncertainty
  - No single generation source will supply more than 15-20% of CAP's pumping requirements

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## Recommendations

**Base Load**

This is not schedulable and would be exposed to the market prices

- Recommendation: Hedge up to 90% of the Base Load prior to the delivery year
  - This strategy is typically executed on a staggered basis

**Variable Load**

This is schedulable and would have limited exposure to high market prices

- Recommendation: Hedge not more than 10% of the Variable Load prior to the year of delivery
  - This strategy is typically executed on a staggered basis

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