



# Portfolio Analysis Update

Power Committee Discussion

August 30, 2004

# What needs to happen today IF we are to make schedule

- ◆ Decide on a base plan
- ◆ Identify (limited) additional sensitivities

# Agenda

- ◆ Review of major changes
  - Treatment of IPPs
  - Gas Prices
  - CO2 emissions penalties
  - Coal prices/Transmission
  - Conservation
- ◆ Discussion of new “Base Case”
  - IPP Treatment
  - Conservation levels
  - Selection of Plan
- ◆ Sensitivities
  - CO2
- ◆ Next steps

# Treatment of IPPs

- ◆ About 3000 aMW not currently committed long-term to regional load (mostly gas but includes 1100 aMW coal)
- ◆ Previous assumption –
  - IPPs in region; don't have firm TX access out
  - Capital costs sunk
  - Plants dispatch at **operating cost** (if needed)
  - **Region's consumers** get benefit of plants (Difference between market price and plant's operating cost when they operate)

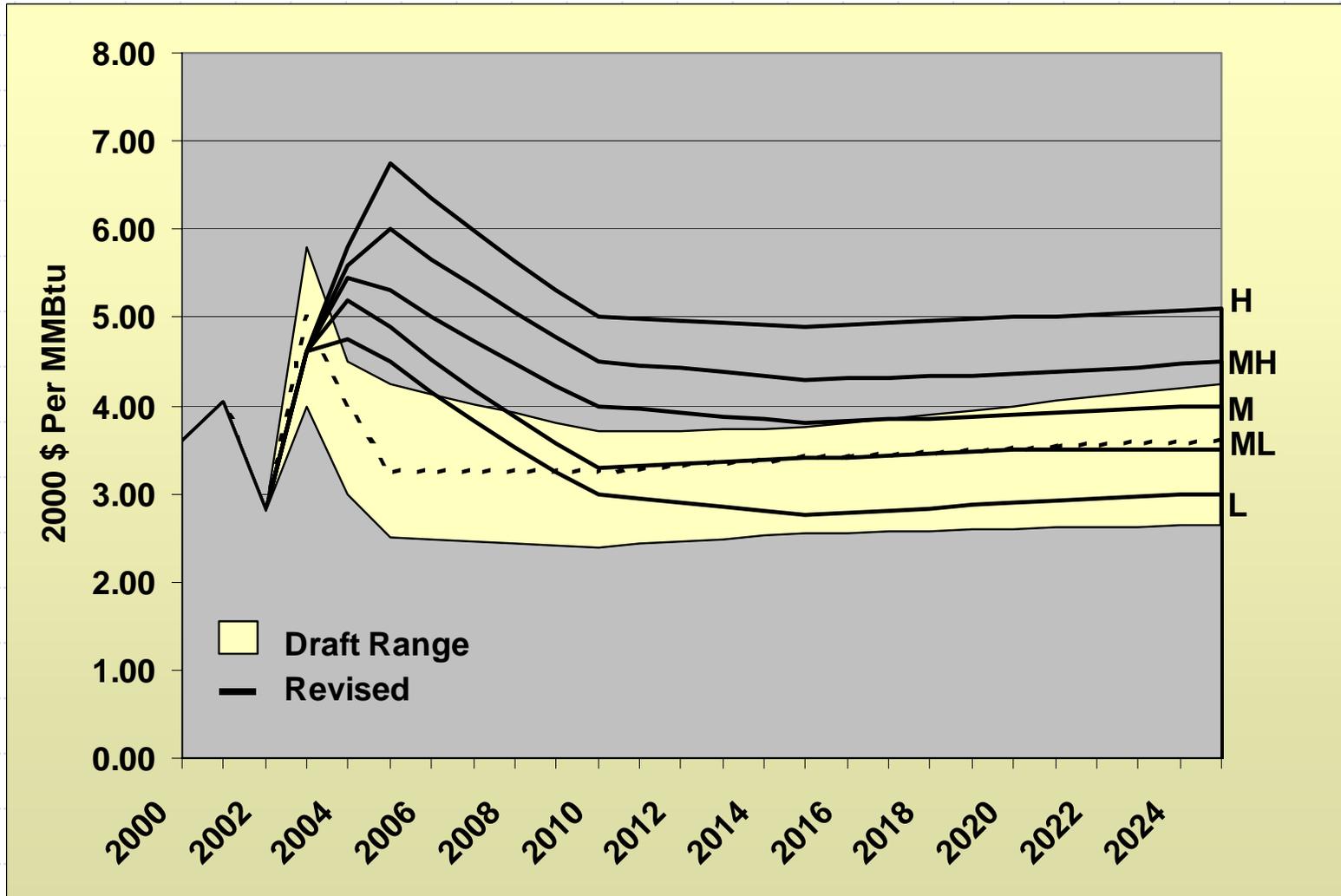
# IPPs (cont.)

## ◆ Revised assumption –

- IPPs still in region; don't have firm TX access out
- Capital costs sunk
- Plants dispatch at **market price** when needed
- **OWNERS** get benefit of plants (Difference between market price and plant's operating cost when they operate)
- Model may decide to build other plants to avoid costs of market purchases

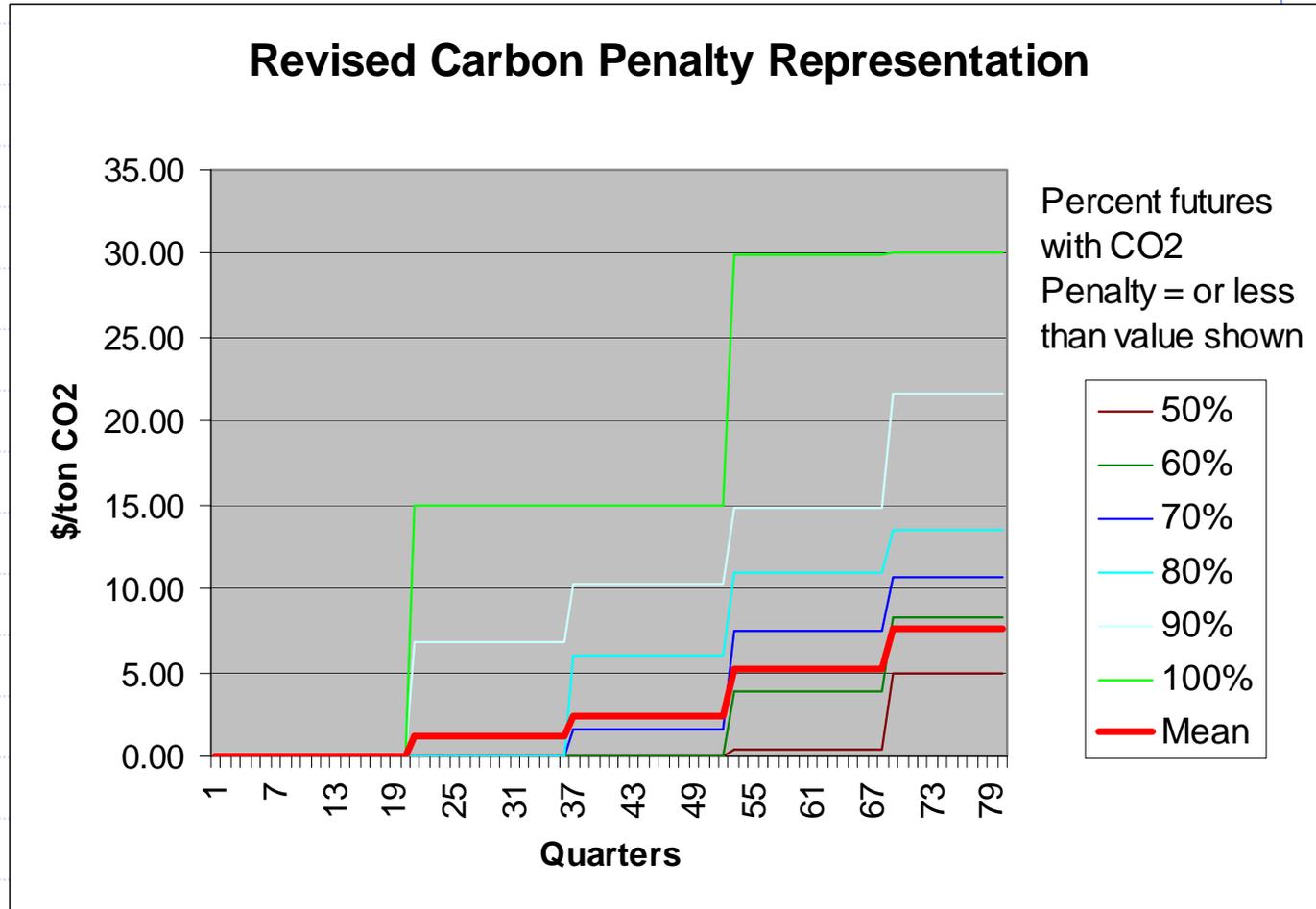
## ◆ Reality – some combination of purchase of IPP generation (or L.T. contracts) and new builds.

# Revised gas prices



# CO2 Penalties

- Phased in
- No penalty in 33% of futures
- Mean values less than values in utility IRPs



# Coal prices/MT Transmission

- ◆ Reviewed our data
- ◆ Met with representatives of developer
- ◆ Conclusion – current data is an adequate representation of MT coal using unallocated TX capacity at embedded cost rates (up to 400 MW)
- ◆ Much controversy within transmission community re cost of transmission upgrades – NTAC study not available until the winter

# Conservation assumptions

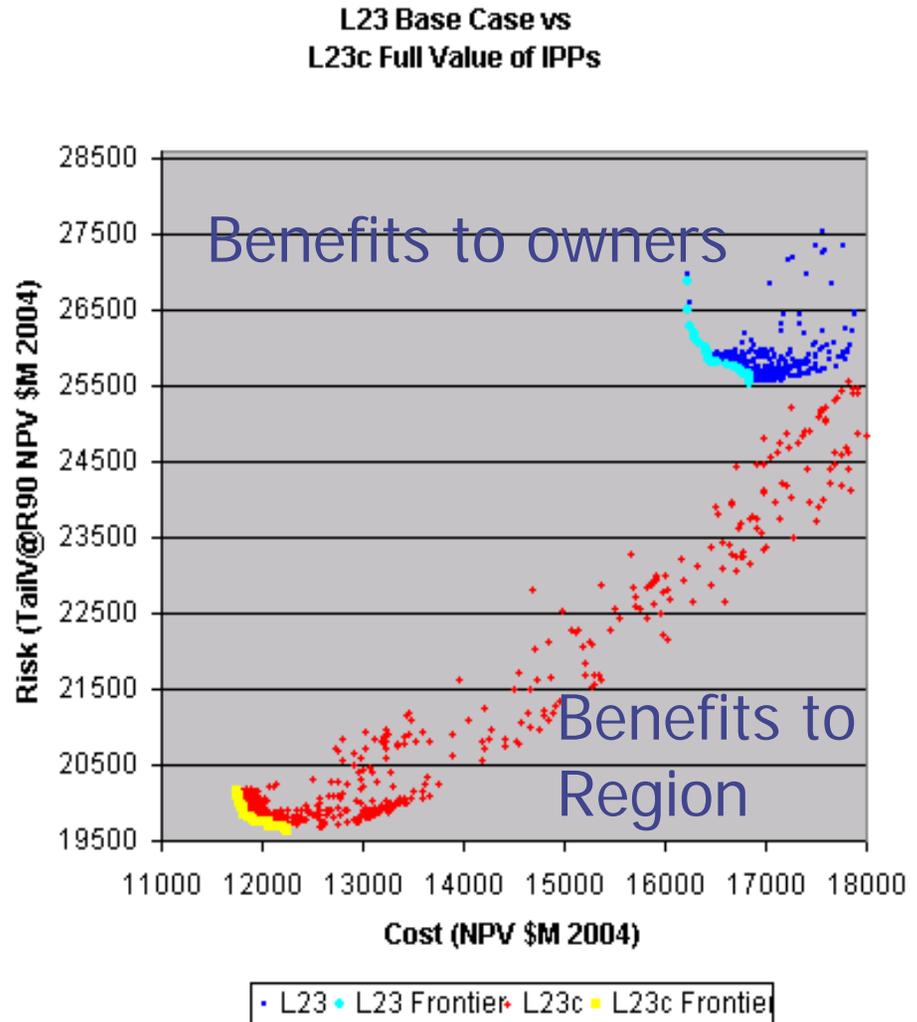
- ◆ Revised supply curve for “discretionary” conservation
  - Added industrial conservation inadvertently left out (350 MW @ costs between 1-2 cents/kWhr)
  - Bundled measures to reflect implementation realities – you don’t get to do only the cheapest stuff first (costs up to 4.8 cents/kWhr, avg 2.1 cents/kWhr)
- ◆ Extended phase-in (how long before you can actually achieve potential potential) for lost opportunity conservation
  - 12 yrs instead of 6

# Effect of treatment of IPPs

Resource Development	Previous (Benefits to region)	Revised (Benefits to owners)
Coal-fired gen	No coal	400 MW Coal
CCCT and SCCT	None	Limited SCCT CCCT late in period
Wind	Lots in low risk plans, CY09	Lots in low risk plans, CY11
Conservation	About the same	About the same

# Current assumptions re IPPs increase cost and risk to region

- ◆ Because benefits go to owners not consumers
- ◆ Region can secure some of the benefits by
  - Purchasing/contracting LT with IPPs; or
  - Building something
  - Both appear to be happening
- ◆ But at a cost
  - Difference in cost indication of value
- ◆ But lots of other factors enter into decision



# Recommendation

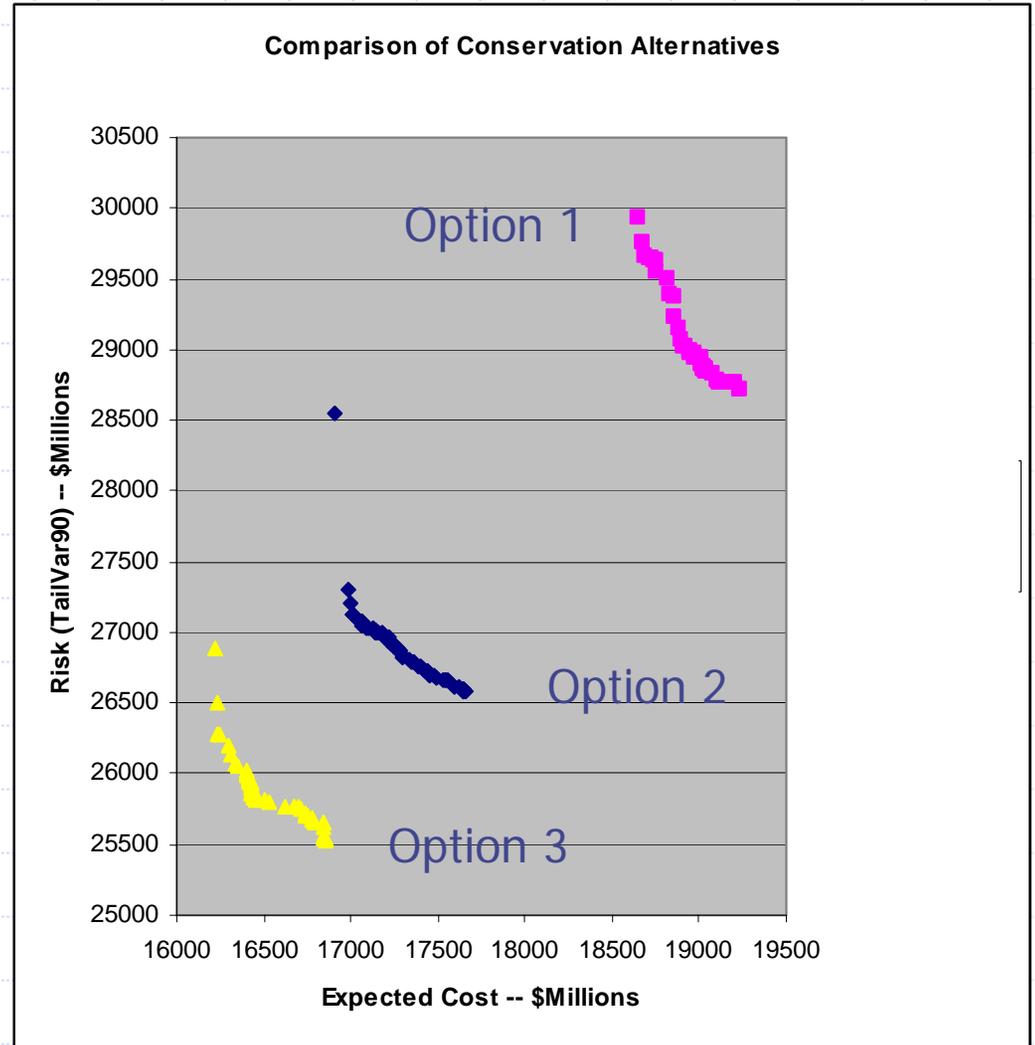
- ◆ Use assumption of IPPs not owned by regional entities as base
- ◆ Careful discussion of the situation
  - Don't want to tilt playing field unfairly one direction or the other

# Conservation Alternatives

## Three alternatives

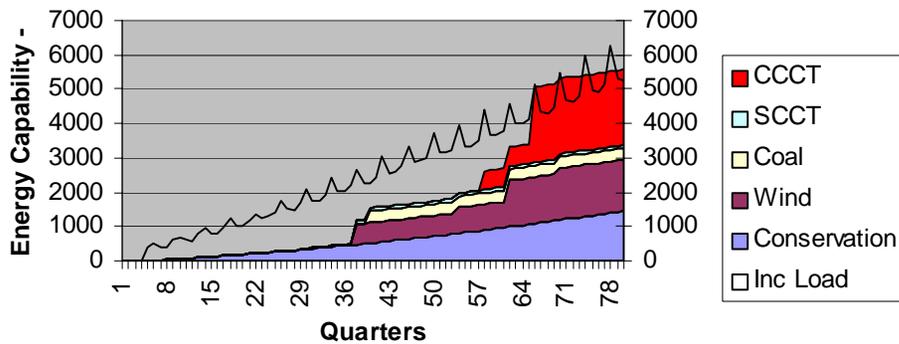
- Option 1
  - ◆ Discret. – 10MW/Qrtr
  - ◆ LO – 20 year phase in
- Option 2
  - ◆ Discret. – 20MW/Qrtr
  - ◆ LO – 12 yr phase in
- Option 3
  - ◆ Discret. – 30MW/Qrtr
  - ◆ LO – 12 Yr phase in

◆ Significantly reduced cost and risk for more aggressive conservation

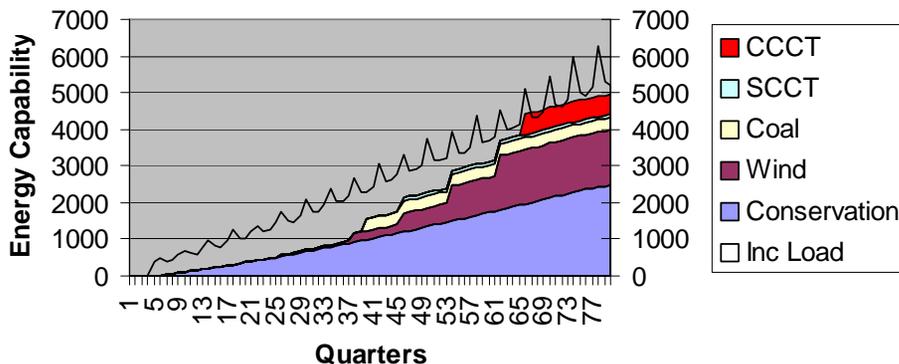


# Different levels of conservation, different Portfolios

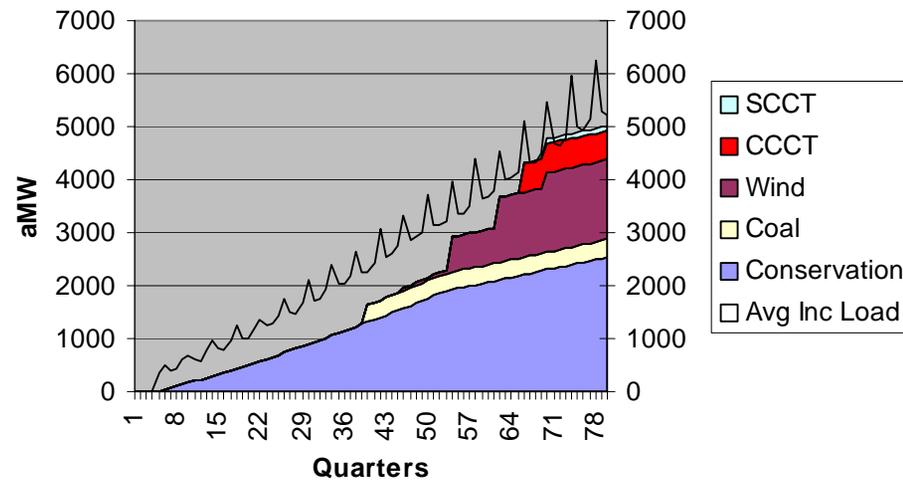
## Option 1



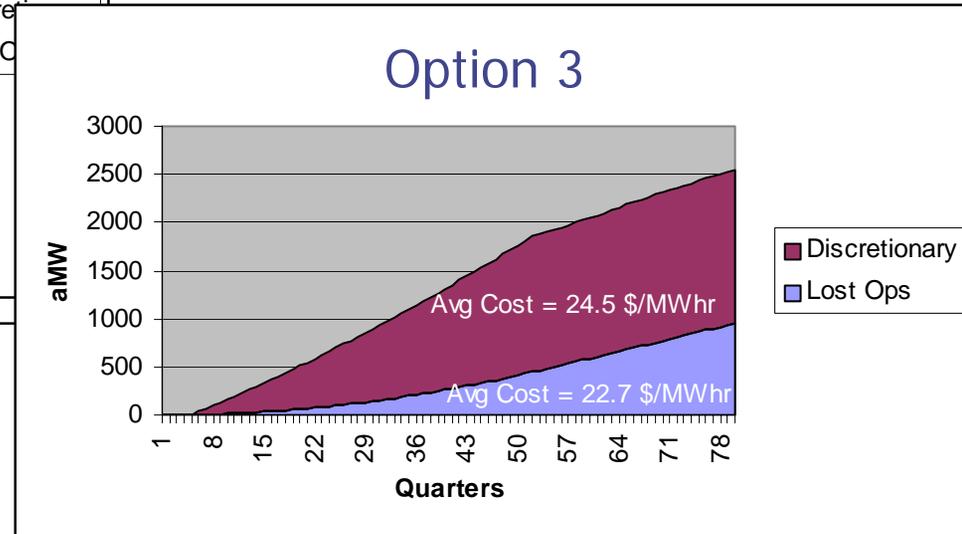
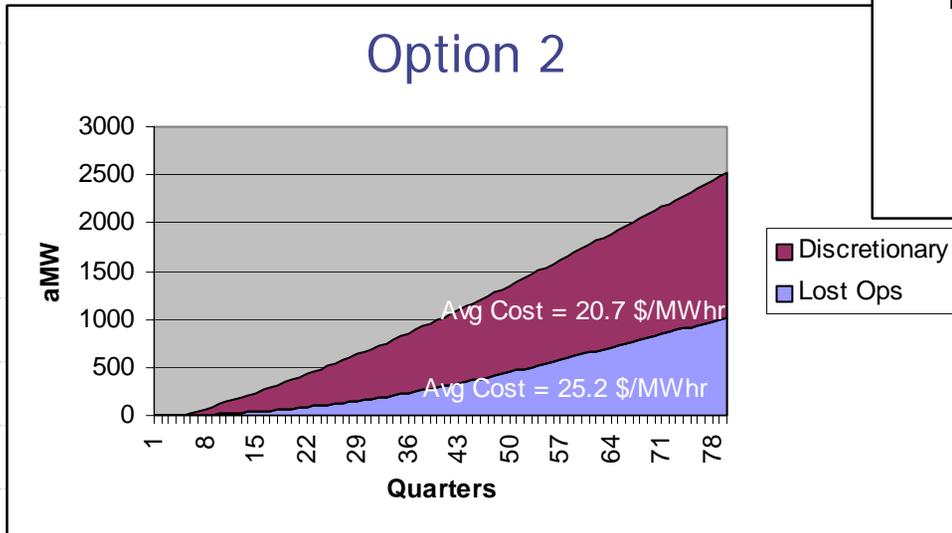
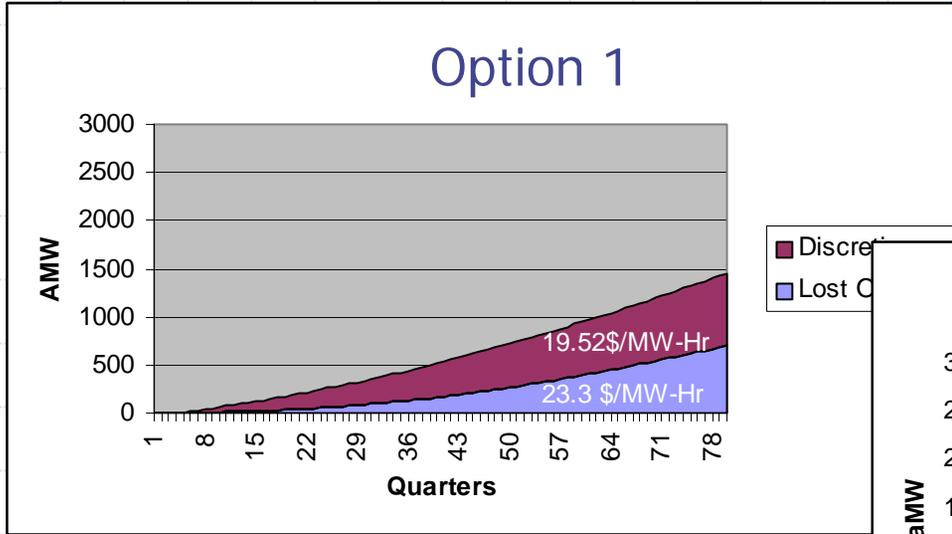
## Option 2



## Option 3



# Conservation Development



# Recommendation

- ◆ Option 3 conservation because
  - Substantial long-term benefit
  - We've done that much in the past
  - We have new capabilities that we didn't have then
  - Many of region's largest utilities are acquiring at about that level
- ◆ Need additional discussion in action plan addressing barriers

Note: This and subsequent charts Assume Option 3 Conservation

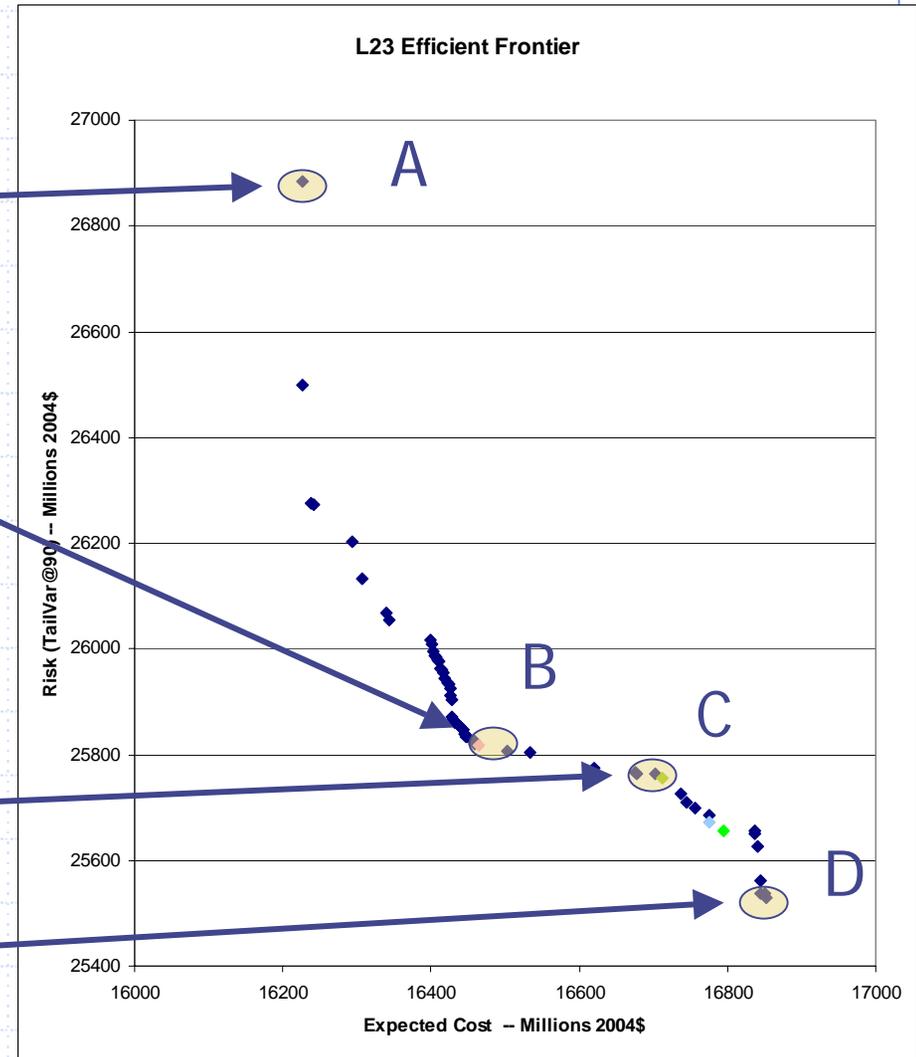
# Choosing "A Plan"

Least Cost – Conservation  
+ market

Plan 886 -- Conservation,  
wind+market

Plan 689 -- Conservation,  
wind, coal+ market

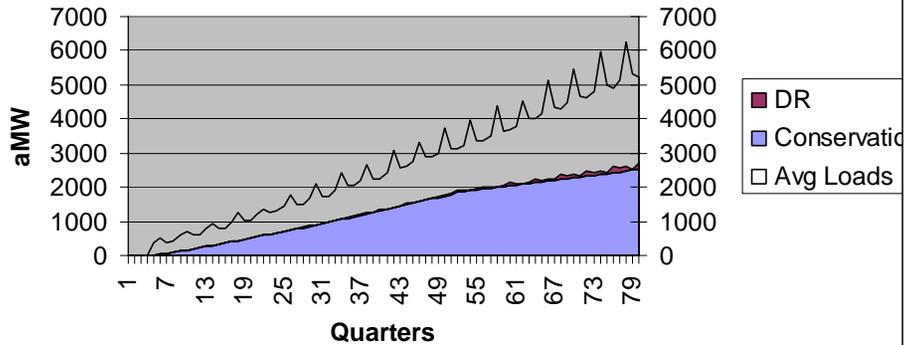
Least risk – Conservation,  
wind, coal, CCCT, SCCT  
+ market



# Comparison of Build outs

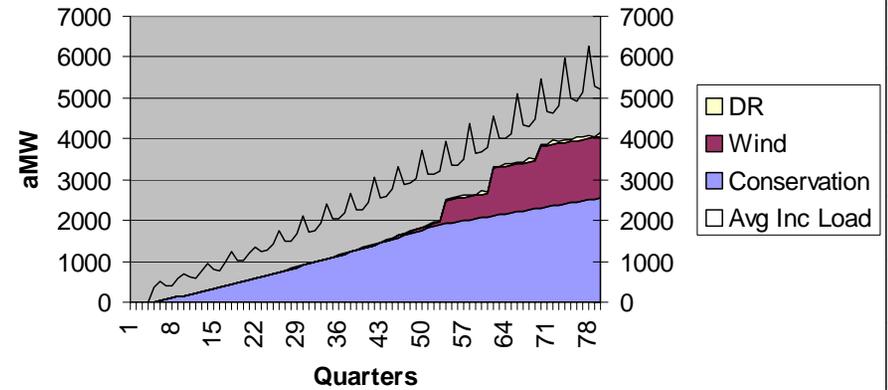
A

**L23 Base -- Least cost  
Most likely buildout**



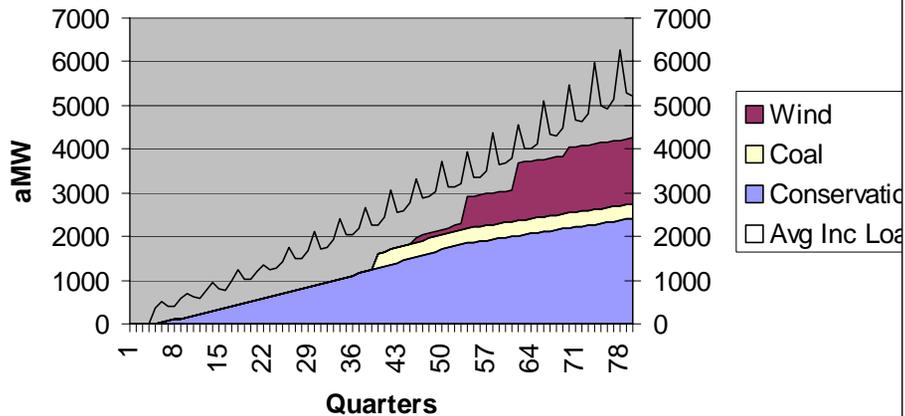
B

**L23 Plan 886 Most likely Buildout**



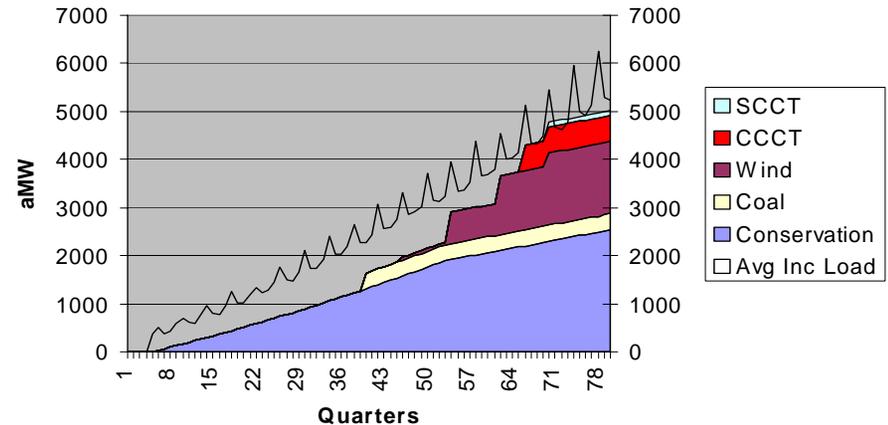
C

**L23 689 Most likely Buildout**



D

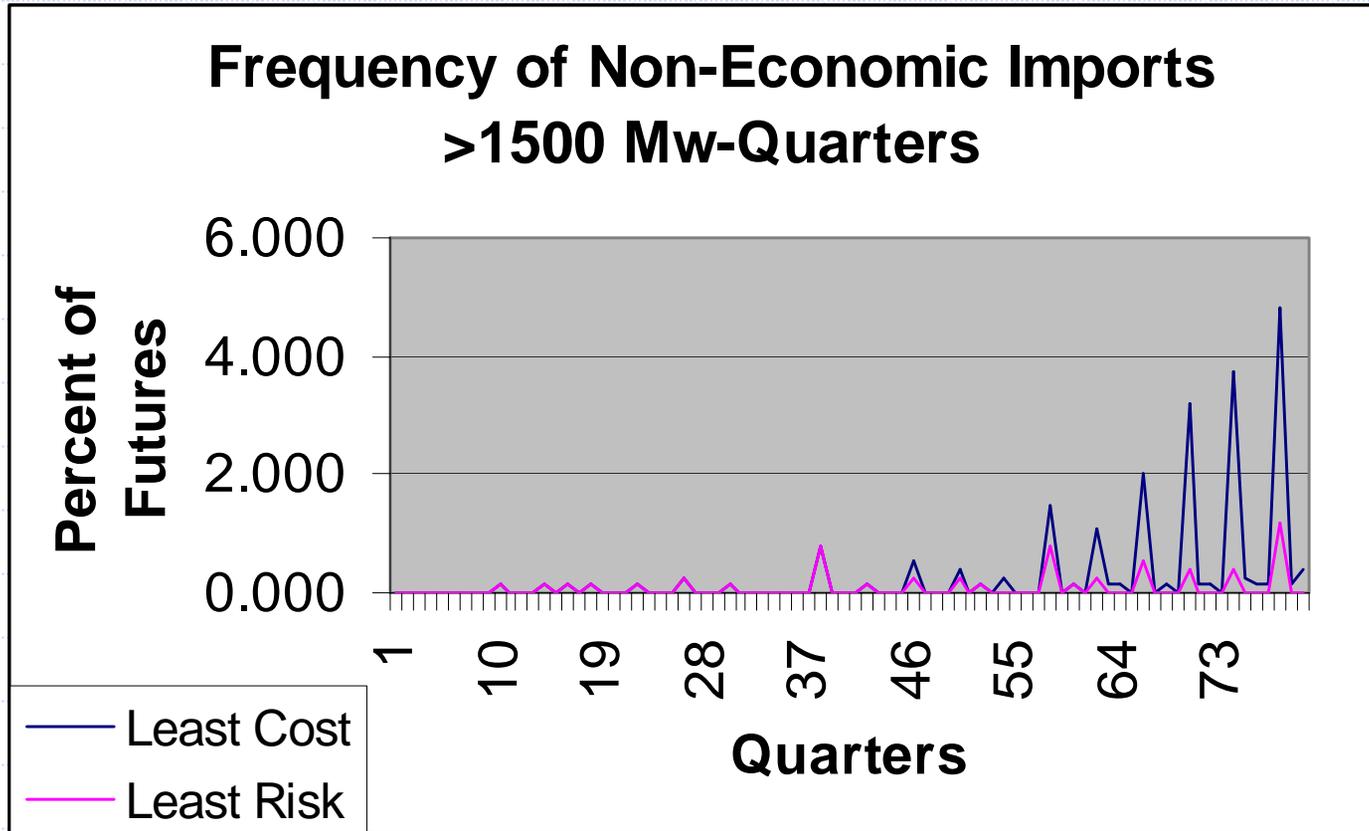
**L22 Least Risk Most Likely Buildout**



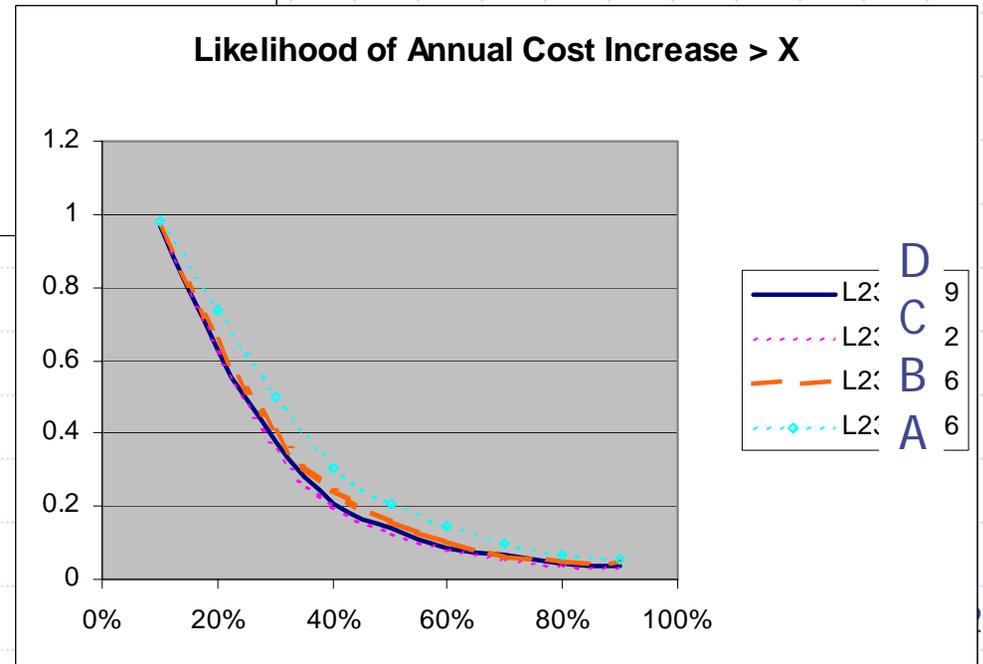
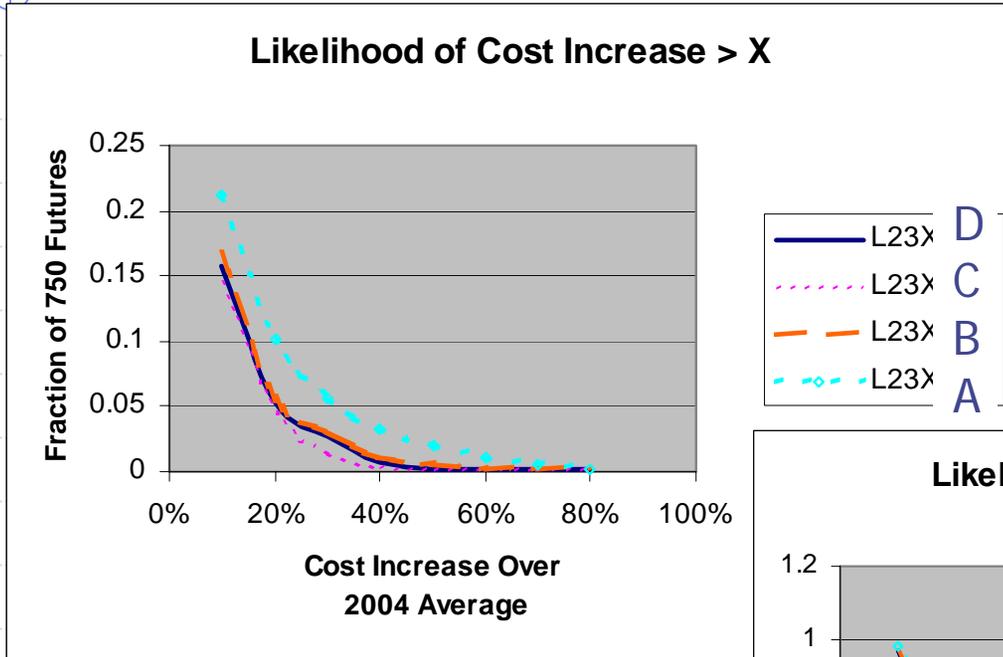
# The Action Plan doesn't change a lot

- ◆ For the five year Action Plan
  - Conservation
  - Confirm/Develop Demand Response Capability
  - Limited commercial scale wind (50-100 MW yr)
  - PLUS -- If plan chosen includes coal, pre-construction activities, including transmission

# Comparative Adequacy

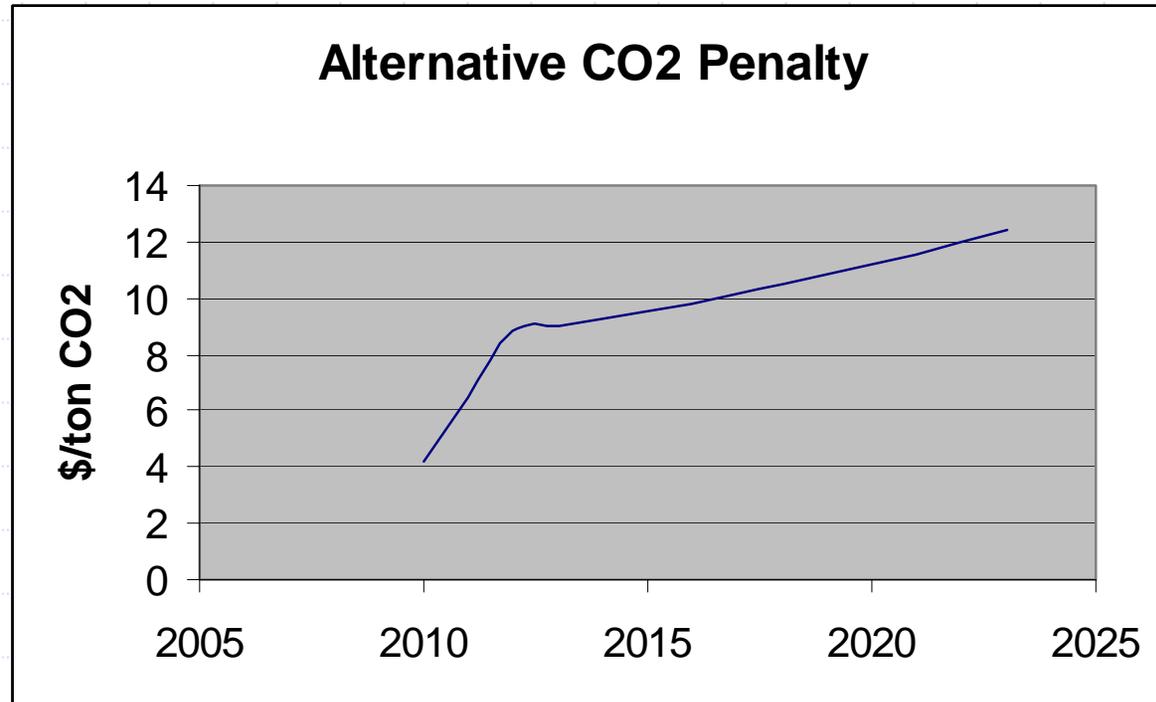


# Retail Price Volatility



# CO2 Sensitivity

- ◆ Test PacifiCorp assumptions – in process



# Additional Sensitivities

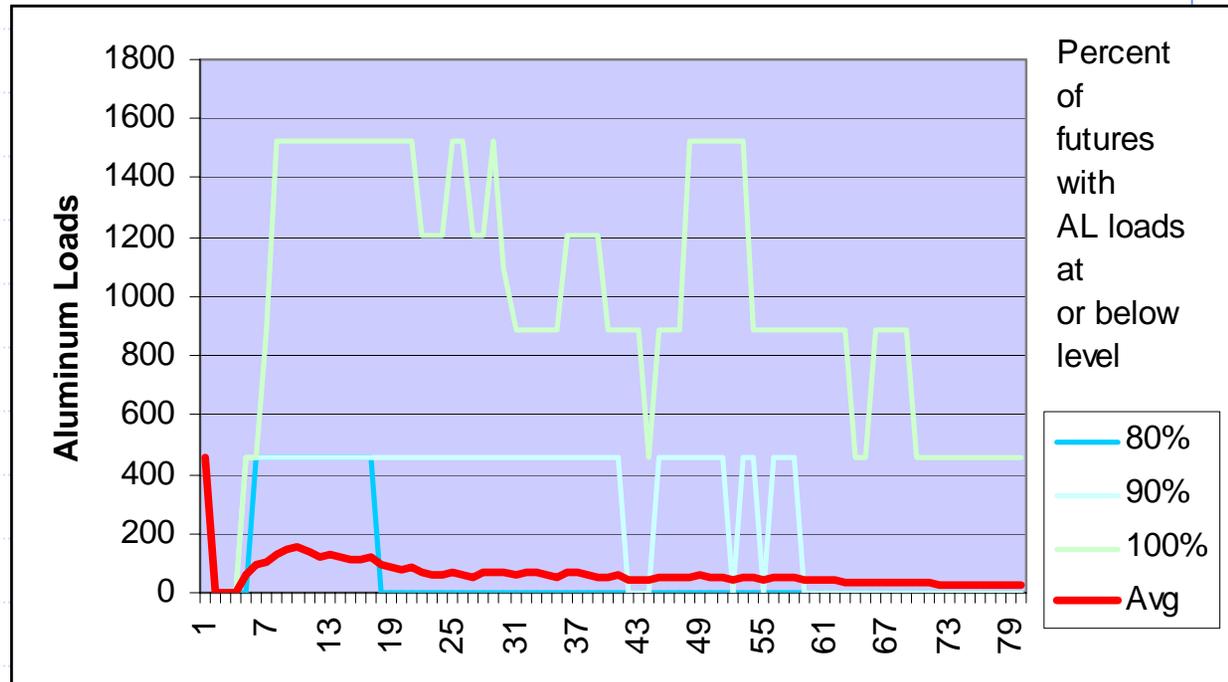
- Additional carbon cost scenarios?
- No demand response – to establish DR's value
- No improvement in wind cost
- Substitute Integrated Coal Gasification (IGC) for pulverized coal technology
- Alberta Oil Sands cogeneration
- DSI support
- Other?



# DSI Support

- ◆ Model incorporates no support (\$ or MWs @ embedded cost rates) for DSIs

- ◆ Level of operation =  $f(\text{market price, Al price})$ , plants retired if out of operation 5 consecutive years



# But Bonneville considering some level of support

◆ Assuming market prices = \$40/MW-hr

Support	\$1600 \$/ton Al	\$1500 \$/ton Al
0	885 MW Al load	0 MW Al load
100 MW @ \$7/MW-hr	885	428
200 MW @ \$7/MW-hr	885	885
200 MW @ \$15/ MW-hr	1202	885

Still subject to variation in price of electricity and aluminum

We can model some assumption about support