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January 29, 2009

MEMORANDUM

TO: Power Committee

FROM: Michael Schilmoeller, Power Systems Analyst
Charlie Grist, **Senior Analyst**

SUBJECT: Regional Portfolio Model representation of uncertainty in conservation costs

The Regional Portfolio Model evaluates resource plans against a host of distinct scenarios for generating plant construction costs, load requirements, wholesale market electricity and natural gas prices, and other sources of uncertainty. This presentation discusses staff recommendations for the treatment of uncertainty in the cost of conservation. This presentation does not call for any Power Committee decision. However, staff will seek the guidance of committee members regarding the representation of this source of uncertainty.

Conservation cost uncertainty is new to the Council's planning process in the Sixth Power Plan. It originates from multiple sources and is informed by our experience in predicting the cost and availability of conservation over the twenty-five year Council's history. Our presentation will elaborate.



Conservation Cost Uncertainty

Charlie Grist and
Michael Schilmoeller
Power Committee web-conference
Thursday February 5, 2009

Overview

- Objectives
- Approach



Sources of Conservation Uncertainty

Source of Uncertainty	Example
• Input Materials Cost	Steel, glass, insulation, electronics, rare-earth phosphors
• Input Labor Cost	Skilled and unskilled labor
• Cost of Capital	If conservation is financed
• Existing Baseline Condition	How may new dishwashers are better than federal standard in the base case assumption?
• Technological Progress	When will today's measure be superseded by a much better or cheaper idea? Progression of Linear Fluorescent Efficacy.
• Future Penetration	How many houses are left to insulate? How many can we just never get to?
• Future Stock Estimate	How many TVs will be purchased? What size? Plasma or LCD?

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Sources of Conservation Uncertainty

Source of Uncertainty	Example
• Future of End Use	Home entertainment energy requirement now exceed that of refrigeration. What new end use might emerge next? Which industries will emerge and which will survive?
• Future of Industry	Chip fabrication, airplane manufacture, pulp & paper?
• Measure Performance	Will forecast savings be realized in the field?
• Customer Acceptance	For how many applications will occupancy sensors be too annoying?
• Health and Safety Interactions	Will unforeseen future health requirements for indoor air quality negate energy savings from energy efficient ventilation strategies?
• Program Performance	Will program design be ineffective? Or we will get more savings than anticipated because we put the measure in code?

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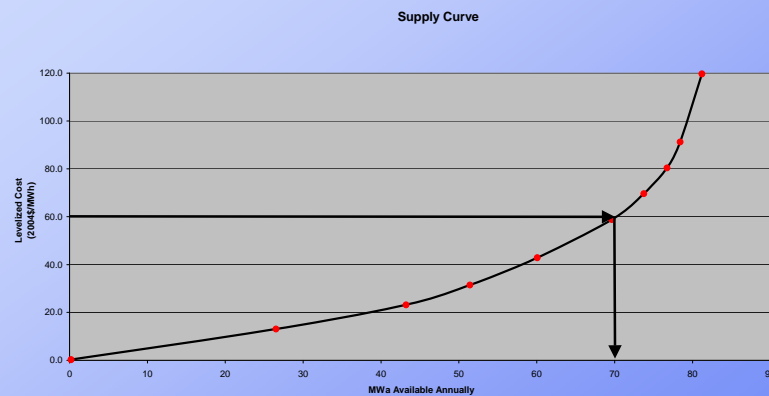
Sources Simplified

- Cost (\$/MWh) Uncertainty
 - Input Materials Cost, Input Labor Cost Cost of Capital, Health and Safety Interactions
- Performance (MWh) Uncertainty
 - Baseline Condition, Technological Progress, Penetration, Stock Estimate, Future of End Use and Industry, Measure Performance, Customer Acceptance, Health and Safety Interactions, Program Performance

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Effect on the Supply Curve

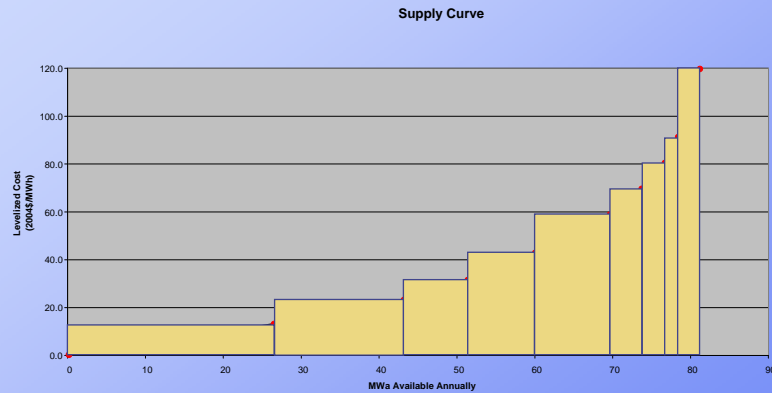


Supply curves

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Effect on the Supply Curve



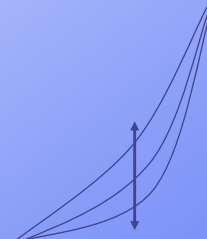
Supply curves

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Cost Effects

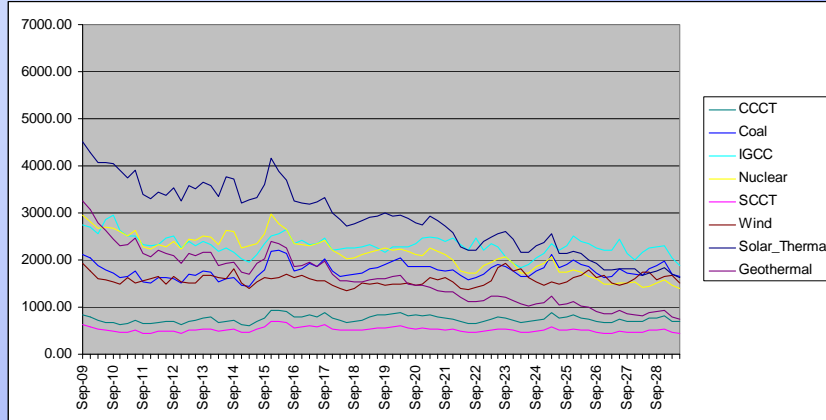
- Capture with uncertainty in the convexity of the curve
- Expect that there is more likelihood of downward motion (greater convexity)
- Tied to construction cost uncertainty, assuming 50 percent of conservation cost is labor and the rest follows “bulk materials” cost



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Individual Futures

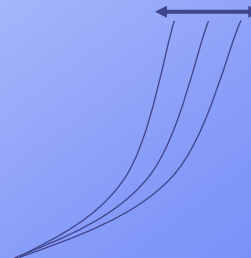


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Availability on Conservation

- Capture with uncertainty in the endpoint of the curve
- Expect that our estimates of availability are unbiased
- Will permit conservation availability to vary by a factor of $\frac{1}{4}$ (25 percent higher or lower)



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Summary

- Applied to discretionary and lost opportunity conservation in each future
- Want to understand if this has a bearing on the cost effectiveness threshold or the amount of conservation we realize

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End

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