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April 2, 2009

MEMORANDUM

TO: Power Committee

FROM: Wally Gibson

SUBJECT: Appendix N - Financial Assumptions and Discount Rate

Appendix N is a slightly updated version of the paper that was originally presented to the Power Committee on April 15, 2008.

It describes the issues involved in choosing a discount rate, both theoretical and methodological. It discusses the approach the Council chose at that time and the financial assumptions used in the draft plan, focusing primarily on the calculations leading to the recommendation for a discount rate to be used in the draft plan. The discount rate that was chosen was 5 percent. The various financial assumptions are summarized in the table below.

Item	Value	Range
Inflation	2.0%	NA
Municipal/PUD real discount rate	3.3%	NA
Co-op real discount rate	4.6%	NA
IOU real cost of equity	8.8%	NA
IOU real cost of debt	5.5%	NA
IOU real discount rate (tax-adjusted)	5.3%	NA
BPA real discount rate	4.5%	NA
Residential consumer real discount rate	3.9%	3%-5%
Business consumer real discount rate	7.7%	7%-9%
Real discount rate for plan	4.9%	4.7%-5.5%

The values were updated in January, 2009, based on the then most-recent Global Insight long term forecast, which was also the basis for several other pieces of the analysis for the draft plan. Because of forecast production time lags, the forecast did not incorporate the near-term effects of the recent financial turmoil. The data will be updated for the final plan analysis, but should not change the results of the plan analysis significantly.

Financial Assumptions and Discount Rate – Appendix N

Power Committee
Skamania, Washington
April 15, 2009



April 15, 2009

Overview of Appendix N

- Financial assumptions and discount rate
- Alternative ways of thinking about discount rate
- Council's approach
 - Focus on decision-making entities: utilities and customers
- Financial assumptions and calculation of recommended values
 - Regional decision makers
 - Range of values to look at – use 5% for discount rate
- Recommend region's utilities use Council approach, utility financial values



Data Updating Issues

- Data updated from recent Global Insight macroeconomic forecast
 - Because of forecast production lags, it did not capture recent effects of financial turmoil on near to intermediate term expectations
 - Expect next forecast will
- We will update the data between draft and final plans
 - Should not have a major effect on the outcome

Financial Assumptions

Item	Value	Range
Inflation	2.0%	NA
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Background Slides

April 15, 2008 Presentation to Power Committee

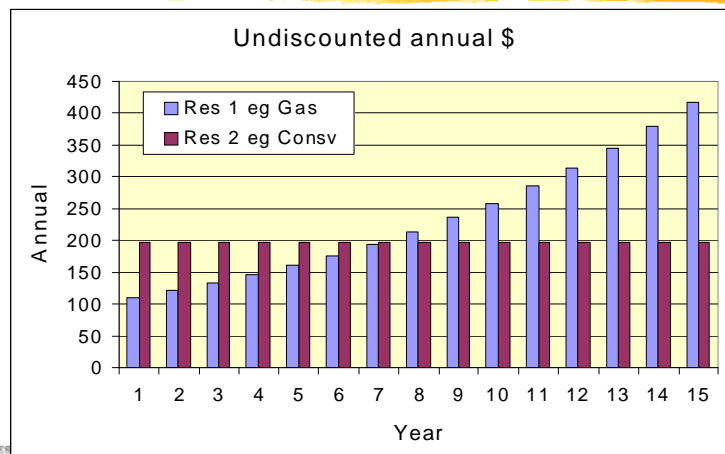
Financial Assumptions

- Costs of capital for various entities
 - Equity cost for IOUs
 - Bond costs for all entities
 - Costs of the entities that develop the resources
- Discount rate
 - Used to compare costs at different points in the future
 - Net present value - summary cost number
 - Levelize the net present value – summary number
 - Used to adjust both future capital and operating costs

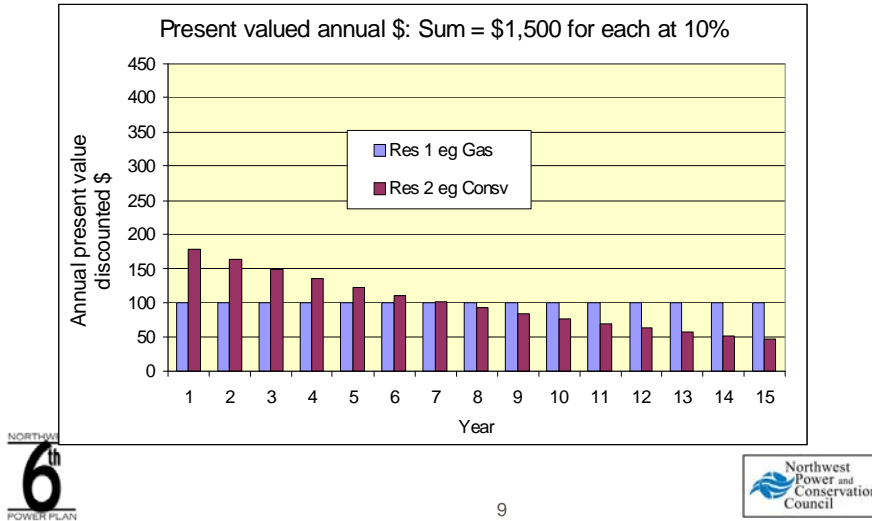
Discount Rate

- Question: Choose to pay \$100 today or \$110 next year?
- Answer (rate of time preference) is based on interest rates
 - Dollar invested now worth more in the future
- Terminology
 - \$100 = present value and \$110 = future value
 - 10% = discount rate – the rate that makes them equivalent
- At 8%, \$100 today is \$108 next year: prefer to pay \$100 today
- At 12%, \$100 today is \$112 next year: prefer to pay \$110 next year
- Next slides: both resources have \$1,500 present value and \$100 levelized cost

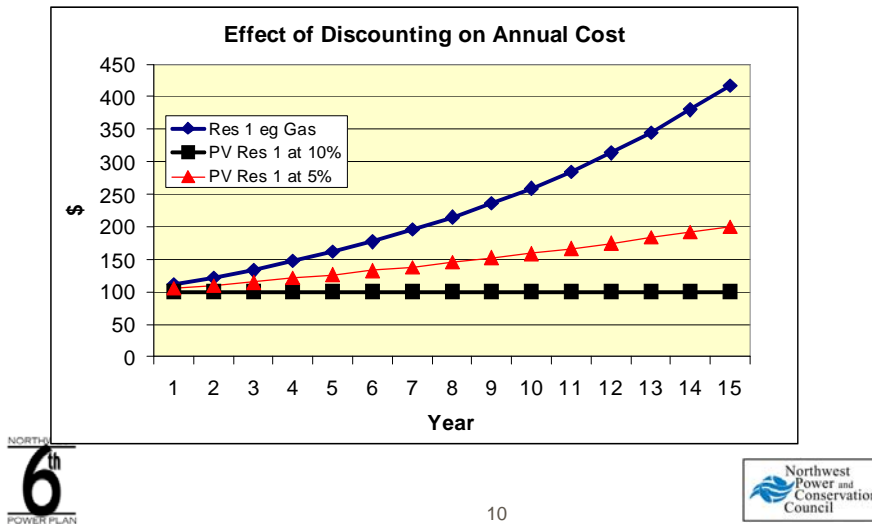
Start with Series of Annual Costs



Calculate Present Values and Add



Effect of Different Discount Rates



Alternative Ways of Thinking About Discount Rates

- Three general perspectives
 - Regional consumer's perspective
 - Corporate perspective
 - National or social perspective
- Differ with regard to implied decision maker
 - Do only consumers count or do intermediate entities like utilities?
- Differ with regard to treatment of income taxes
 - Take account of income taxes or not?
- Risk dealt with separately in Council analysis

Regional Consumer's Perspective

- Looks only at the region's consumers as the ultimate interests at stake
 - Residential and business purchasers of electricity
 - Costs of capital and opportunity costs of purchases (money not available for savings)
 - Large range of alternatives possible for residential consumers – credit cards to stock investments
- Does not take account of entity making investment decisions
- The perspective used in earlier power plans

Corporate Perspective

- Financial literature almost uniformly recommends corporate perspective – even for not-for-profit entities
- Uses weighted after-tax cost of capital to the corporate entity
 - Ensures consistency between evaluation of projects and the cost of undertaking them
 - After-tax – recognizes deductibility of debt for income taxes reduces its effective cost (cf. mortgage deductibility)
- Widely used – IOUs, Bonneville, some public utilities, much of rest of the economy
 - Use of something else could distort overall decision making in the economy

National or Social Perspective

- Similar to regional consumer's perspective
 - But – looks at pre-tax rather than after-tax cost of capital
 - Argues that income taxes are deliberately incurred and do not matter on the national level
- Sometimes combined with corporate perspective to argue that governments should use private sector cost of capital (but pre-tax) rather than their own.

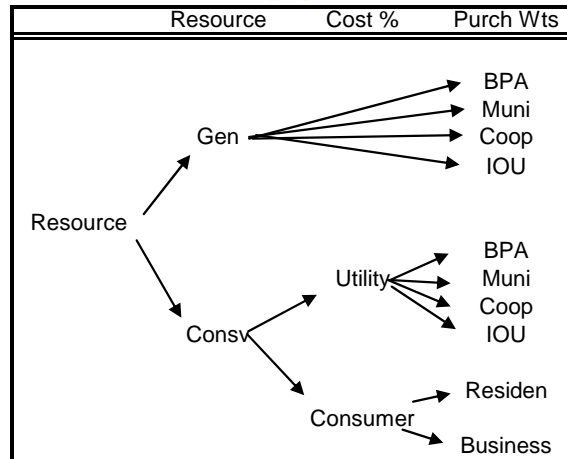
Recommended Perspective

- Modified corporate perspective – takes account of different decision makers for different resources
 - Income tax-adjusted cost of capital to entities making decisions, including consumers
- Council adopted corporate perspective in Fifth Power Plan
 - Recommendation adds to set of decision makers referred to in Fifth Plan
 - Adds residential and business consumers – decisions on conservation actions not funded by utilities

Calculation of Discount Rate – 1

- Based mostly on forecast of inflation and interest rates from Global Insight – averaged over 2010-14 (Action Plan period)
 - Will be updated once more before analysis for draft plan
- Set of assumptions about resource and decision-maker shares
 - Generation financed by utilities
 - Uncertainty about share of publics' load on BPA
 - Conservation partly purchased by utilities, partly by consumers
 - Consumer share partly residential, partly business

Schematic of General Approach – Looking at Decision Makers



Calculation of Discount Rate – 2

- Uncertainties in assumptions suggests using range of values
- Residential and business discount rate estimates from DOE study
 - Had to be adjusted to make income tax calculations and inflation consistent with general approach and other calculations
 - Inconsistency in DOE report led to uncertainty
 - Addressed with range of values also
- Caveat: Composite appropriate for Council Plan, individual utilities recommended to use their own cost of capital