Benefit/Cost Analysis Discussion

MEPETF

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Benefit/Cost Analysis: Basic Concepts

- **Sum Identified Benefits (positive and negative)**
  - **Inclusive list of benefits and costs**
  - **Cost/Benefit analysis is intended to measure the positive or negative consequences of a project.**
  - **To evaluate benefits:**
    - **List all parties/categories of parties affected by the project**
      - Add the positive or negative value of the project to each party
      - Benefit = the net benefits

Benefit/Cost Analysis: Basic Concepts

- **Risk associated with project outcomes is usually handled with probability theory.**
  - **Can be factored into the discount rate**
  - **Can/should be considered separately**
  - **Risk can be used to weight results**

- **Uncertainty in assumptions/parameters should be evaluated with sensitivity analysis**
  - **Monte Carlo**
  - **Both Benefits and Costs subject to uncertainty**

PJM Benefit Cost Analysis

- **Market Efficiency Projects intended to address:**
  - **Energy market constraints**
    - **Compare Benefits to Costs**
  - **Capacity market constraints**
    - **Compare Benefits to Costs**
- **Total Benefits = Energy Benefits + Capacity Benefits**

PJM Regional Energy Benefit Analysis

- **Regional Projects: 50 percent Change in Total Energy Production Cost + 50 percent Change in Load Energy Payment**
- **Change in Total Energy Production Cost**
  - **Calculated for the whole PJM Region**
  - **Total change in energy production cost**
- **Change in Load Energy Payments**
  - **Calculated for each transmission zone**
  - **Includes only zones that show a reduction in load energy payments**
  - **Total change in load energy costs not considered.**

PJM Low Voltage Energy Benefit Analysis

- **Regional Projects: 100% of change in Load Energy Payments**
- **Change in Load Energy Payments**
  - **Calculated for each transmission zone**
  - **Includes only zones that show a reduction in load energy payments**
  - **Total change in load energy costs not considered.**

PJM Capacity Benefit Analysis

- **Mirrors Energy Benefit Analysis**
- **Regional Projects: 50% Change in System Capacity Cost + 50% Change in Load Capacity Payment**
  - **Total system capacity cost**
  - **Load capacity payments included if lowers cost**
- **•Lower Voltage Projects: 100% change in Load Capacity Payment**
  - **Load capacity payments included if lowers cost**

Issues with Benefit Analysis

- **Current B/C Analysis only lists energy benefit to those zones that would benefit from the project**
  - **Ignores zones that would be hurt by project.**
- **To evaluate benefits, need to list all parties/categories affected by the project**
  - **Add the positive or negative value of the project to each party**
  - **Benefit = the net benefits**

Need to account for Risk in Benefit/Cost Analysis

- **Cost assumptions in B/C analysis are not subject to rigorous sensitivity analysis**
  - **One cost estimate used in ratio**
  - **Does not explicitly account for relative risk of estimate among projects**
  - **No explicit probability assessment of risks of cost escalation among projects**

- **Uncertainty in assumptions/parameters can be evaluated with a sensitivity analysis**
  - **Monte Carlo**
  - **Both Benefits and Costs subject to uncertainty**

Need to account for Risk in Benefit/Cost Analysis

- **Benefit assumptions in B/C analysis are not subject to rigorous sensitivity analysis**
  - **One benefit estimate used in ratio**
  - **Does not explicitly account for different probabilities (generation build, changes in fuel costs, load change) in ratio**

- **Uncertainty in assumptions/parameters can be evaluated with a sensitivity analysis**
  - **Monte Carlo**
  - **Both Benefits and Costs subject to uncertainty**

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