MMU Evaluation of Projects for the AC Transmission Public Policy Transmission Need

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Evaluation of Market Impacts: Principles

- MMU must "review and consider" impact on NYISO markets
- PPTN from economic, reliability, environmental objectives
  - ✓ Most impacts priced by wholesale market
  - ✓ Value of some non-wholesale benefits can be quantified
  - ✓ Upstate to downstate flows are a proxy for other benefits
- But uneconomic transmission investment can harm market by:
  - ✓ Inefficiently altering energy and capacity prices,
  - ✓ Crowding-out efficient private investment, and
  - ✓ Raising the cost of satisfying public policy objectives.
  - ✓ Thus, criteria for determining if a project is uneconomic:
    - *Priced and unpriced benefits exceed project costs*

Evaluation of Market Impacts: Key Metrics

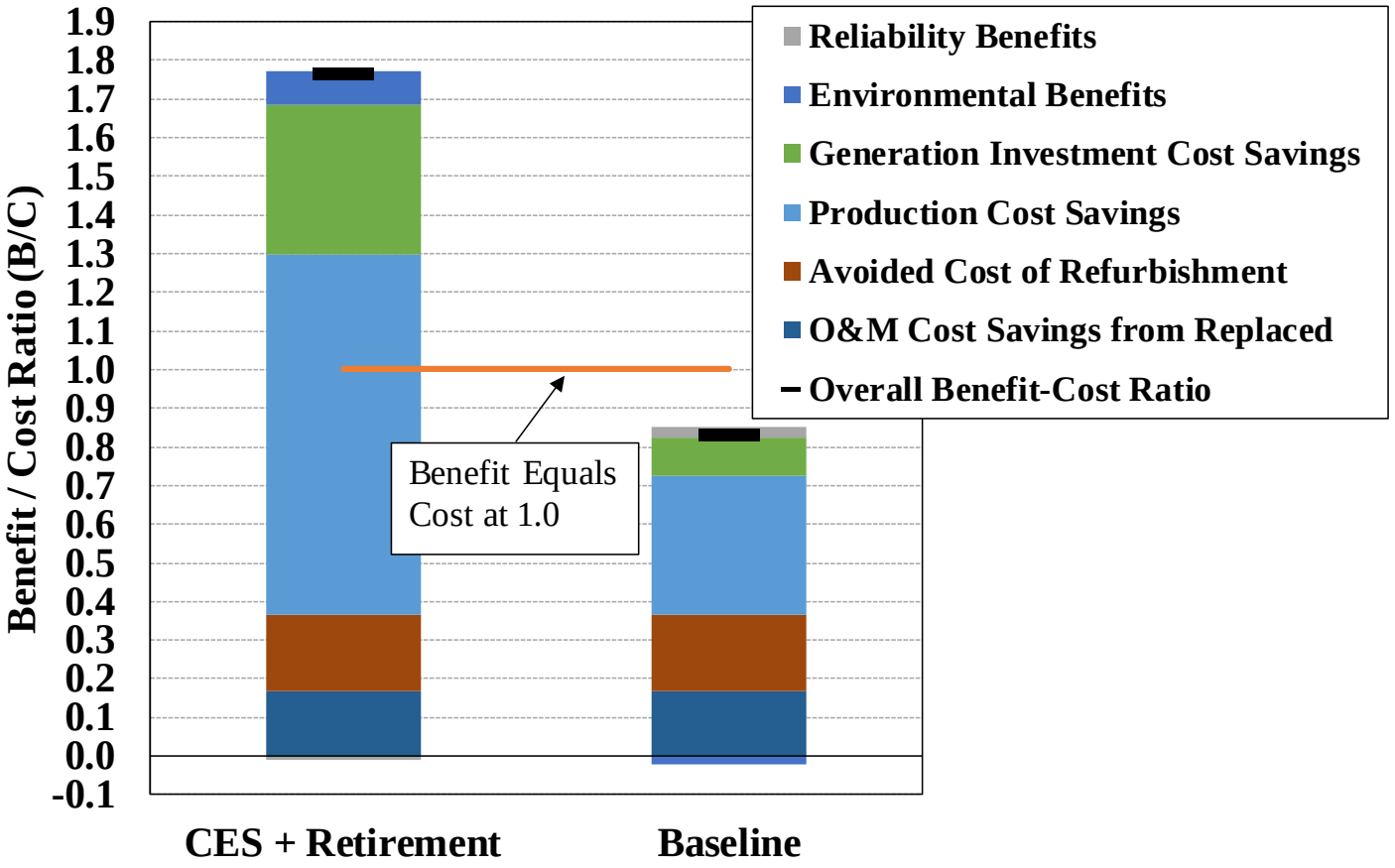
- Benefit-cost ratio compares the capital costs of T027, T029, and local upgrades and O&M costs to:
  - ✓ Production cost savings
  - ✓ Investment cost savings,
  - ✓ Reliability benefits from improved LOLE,
  - ✓ Environmental benefits from CO_2 abatement, and
  - ✓ Avoided refurbishment costs and O&M costs for decommissioned equipment.
- Reducing Need for Generation in downstate areas
  - ✓ Most related benefits are reflected in the B/C ratio
  - ✓ Indication of benefits not quantified in $s
- Congestion patterns post-project

Evaluation of Market Impacts: Summary

- Baseline: No retirement/entry for policy or economic reasons
  - ✓ Overall benefit-cost ratio: 0.83
- CES+Retirement: 14 GW new in Zones A-F / 5.7 GW retire in SENY / 226 MW OSW / no storage / no economic entry
  - ✓ Overall benefit-cost ratio: 1.77
  - ✓ Reduction in downstate generation:
    - Production: 210 MW (~4%)
    - ICAP: 300 MW (~2%)
  - ✓ Congestion in 2030:
    - Between Segments A and B and
    - Downstream of Segment B

Evaluation of Market Impacts: Benefit-Cost Ratio

Figure 1: Results for T027 and T029 Combination



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Estimating Benefits: Production Cost & Environmental

- Example 1:
  - ✓ Increase NY unit: $2 of fuel/VOM costs and no emissions
  - ✓ Reduce NY unit: $20 of fuel/VOM costs and $8 of allowances
  - ✓ Environmental Benefit = $8 = $8 minus $0
  - ✓ Economic Benefit = $18 = $20 minus $2
  - ✓ GE MAPS Cost Saving = $26 = Enviro + Economic Benefit
- Example 2:
  - ✓ Increase Ontario unit and reduce PJM unit with same fuel/VOM costs and emission rates.
  - ✓ GE MAPS simulation has no allowance cost for PJM unit, so NYCA Production Cost Savings = $18 = $20 minus $2
  - ✓ Environmental Benefit + Economic Benefit = $26

Estimating Benefits: Investment Cost Savings & Reliability Benefit

- Example of Investment Cost Savings for a particular year:
  - ✓ Base case: 100 MW of Compensatory MWs in Zone J
  - ✓ Project case: 50 MW in Compensatory MWs in Zone C
  - ✓ Net Savings = 100 MW × Zone J NetCONE of $177/kW-yr
    − 50 MW × Zone C NetCONE of $100/kW-yr
    = $12.7 million for one year
- Example of Reliability Benefit for a particular year:
  - ✓ Base case: LOLE is 0.086 days/yr
  - ✓ Project case: LOLE is 0.076 days/yr
  - ✓ Value of reliability in ICAP market: $2.9M/0.001 days
  - ✓ Reliability Value = (.086 − .076) days/yr × $2.9M/0.001 days
    = $29 million for one year

Conclusions

- Baseline Case:
  - ✓ Likely uneconomic without large-scale renewable upstate
- CES+Retirement Scenario:
  - ✓ Economic if CES is met with significant upstate wind & solar
  - ✓ Displacement of conventional generation in downstate areas is modest
  - ✓ Benefits limited by bottlenecks in Zone F and from Zone G to NYC and Long Island
  - ✓ Benefits would be reduced if CES is met with substantial amounts of offshore wind and energy storage
- MMU Report also recommends several enhancements to the NYISO's methodology for future PPTP processes