Southwest Power Pool’s Balanced Portfolio Approach for Economic Upgrades

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Chief Economist, Missouri PSC

Harvard Electricity Policy Group
Chicago, Illinois
October 2, 2008
SPP Cost Allocation Background

- SPP Regional State Committee (RSC) Board of Directors is comprised of Commissioners from state regulatory agencies in Arkansas, Kansas, Missouri, New Mexico, Oklahoma and Texas.

- RSC has the responsibility for developing cost allocations for transmission upgrades within the SPP
  - SPP is obligated to file at FERC any cost allocation proposals that are recommended by the RSC.

- RSC established the Cost Allocation Working Group with staff from each of the state commissions to work out the details for any cost allocation proposals
  - The CAWG holds monthly meetings open to all stakeholders
  - Michael Proctor (Missouri PSC) chairs the CAWG meetings
Categories of Transmission Upgrades & Cost Allocations

1. Reliability Upgrades
   - Region-Wide Zonal Split

2. Deliverability Upgrades
   - Region-Wide Balanced Portfolio

3. Congestion Upgrades
   - EHV Overlay

4. TBD

Upgrades & Cost Allocations
Developed in 4 Steps

1. Benefit Metrics

2. Cost Allocation

3. Balanced Portfolio Approach

4. Transfer of Zonal Revenue Requirements
1. Benefit Metrics

• Reviewed both Production Cost Savings and Savings from Reduced Load LMP

• Retail loads in SPP region of all the states are regulated

  ⇒ Adjusted production cost (APC) has its roots in state retail ratemaking, where

  production expenses are determined as variable production costs plus purchase power costs less revenues from off-system sales.

  Thus, APC savings translate to reduced rates for customers

  ⇒ APC savings are produced when transmission upgrades result in reduced congestion on the transmission system by allowing lower-cost generation trapped upstream from a transmission constraint to be substituted for higher-cost, downstream generation
Potential Metric Issues

• Contract Dependent Wholesale Customers
  – If long-term contracts are seen primarily as hedges against spot-market prices, then wholesale customers dependent on such contracts for power may not realize near-term benefits from savings in APC, unless such savings are flowed through their contracts.
  – Was a major issue in MISO, but did not appear to be an issue in SPP. Likely related more to retail access in MISO where there is a clear separation between generation and load.

• Independent Power Producers
  – If low-cost generation from an IPP generator w/o contracts to serve load is trapped in a zone, then relieving the congestion could result in higher costs to that zone.
  – Is a potential issue for wind generation in SPP when transmission to deliver wind power to load is not built and wind generation is trapped in supply zones.
    • Transmission upgrades to deliver wind generation is the primary focus of the EHV overlay proposals, not of the Balanced Portfolio.
Benefit to Cost Ratio

• **Benefits:**
  – APC savings are estimated over 10 year period, starting three years in the future
  – Upgrades are assumed to be completed on the same date
  – Reference case assumes all reliability/deliverability upgrades in place when planned or needed

• **Costs:**
  – Revenue Requirements using levelized fixed charge rate estimated over same 10 year period

• **Present Value of Benefits compared to Present Value of Costs.**
  – Balanced Portfolio must have a benefit to cost ratio greater than one (1.0) to be approved.
2. Cost Allocation

• Allocating costs in proportion to benefits proved to be controversial among stakeholders
  – Benefits from upgrades must be estimated for a given set of assumptions that were relevant for a relatively short period of time (10 years) compared to the life of the transmission assets (in the 30 to 40 year range).
  – Benefits from any upgrades implemented at a point in time would be changed by upgrades implemented at a later point in time.

• It was determined that costs would likely be allocated on a region-wide basis through what is commonly called a “postage stamp” rate
  – In order for this cost allocation to be fair to all load, the benefits to any load should exceed the resulting allocation of costs. This led to what is called a “Balanced Portfolio” approach.
3. Balanced Portfolio Approach

- The next step was to determine whether to take a project-by-project or a portfolio approach
  a) If transmission upgrades are evaluated on a project-by-project basis, any interaction among the projects would be missed, and the resulting measure of benefits would likely be incorrect.
  b) Benefits from a single project would likely be cost-beneficial for certain pricing zones within the SPP and not cost-beneficial for other pricing zones.

- A portfolio approach would allow SPP to consider multiple projects with a goal of having the portfolio of projects be cost-beneficial for all pricing zones.
  From these considerations came the concept of developing a Balanced Portfolio of transmission upgrades.
Potential Balancing Issues

- If the robustness of the transmission system is fairly balanced throughout the SPP network, then developing a “Balanced Portfolio” of upgrades might be a feasible objective.

  HOWEVER (“and there is always a however”)

- Without a history of regional transmission planning, individual transmission systems have been developed lacking a regional perspective.

  ⇒ There is no reason to expect a balance across the various pricing zones within the SPP.

- Thus, finding a portfolio of transmission upgrades that would prove to be cost-beneficial to all pricing zones when the costs are allocated on a region-wide basis may not be possible.
Figure III.6

AVERAGE MONTHLY PRICE BY BALANCING AUTHORITY

Prepared by Boston Pacific, Inc. External Market Advisor
Figure III.7

TRANSMISSION CONGESTION MAP
SUMMARY BY FLOWGATE
Figure A5

Top 20 Flowgates by Cumulative Shadow Prices
Most Recent 12 Months of EIS Market

May 2007 through April 2008

Cumul. Shadow Prices $/MW

Portion from Binding Intervals
Portion from Breached Intervals

Supplemental Report Summarizing EIS Market Flowgate Congestion; May 18, 2008; p.9
4. Transfer of Zonal Revenue Requirements

- The transmission upgrades included in a Balanced Portfolio are for 345 kV and above projects.
  - To help balance the portfolio, lower voltage upgrades can be included.
- If this fails, then deficient zones (cost > benefits) are made whole by transferring revenue requirements from their zonal rate to the region-wide rate.
  - Thus, what the load was formally paying 100% would now be shared by non-deficient zones, reducing rates to load in deficient zones (benefit) and raising rates in non-deficient zones (added cost).
### Illustration

#### Results Before Transfers

<table>
<thead>
<tr>
<th>Zone</th>
<th>Benefits</th>
<th>Costs</th>
<th>NB (B-C)</th>
<th>B/C</th>
<th>LRS</th>
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<td>$62,379</td>
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<td>2.41</td>
<td>100.00%</td>
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**Total: 2.41**

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100.00% 6.88%
Benefits of Transfer Approach

1. Transfers of zonal revenue requirements (RR) gives credits to zones with more robust transmission systems by reducing their zonal charges.

2. Reducing zonal RR moves toward a region-wide rate rather toward a zonal rate that places upgrades costs into the zonal rate component on a “beneficiaries pay” basis.

3. “No Losers” approach reduces weight put on estimates of benefits compared to beneficiaries pay or equalizing zonal benefit to cost ratios.

4. Transfers of zonal RR provides a relative “easy” mechanism for treating zones with negative benefits.
Some Tariff Details

1. Implementation of Transfers
2. Displacing or Deferring Other Upgrades
3. Unintended Consequences
1. Implementation of Transfers

100% in Rates after 4 year period

100% in Rates before 4 year period
2. Displacing or Deferring Other Upgrades

• When a Balanced Portfolio displaces another upgrade, then the cost allocation for the displaced upgrade is treated as a benefit to those zones that no longer have to pay for the other upgrade.

• Cost savings for deferred upgrades are estimated and the cost allocation for the deferred upgrade is applied to the cost savings and treated as a benefit to those zones that incur these cost savings.
3. Unintended Consequences

• After a Balanced Portfolio is Approved:
  – An upgrade in the portfolio is canceled;
  – Unanticipated decrease in benefits or increase in costs from the original estimates; and
  – A significant unanticipated change in the transmission system.

• SPP shall review the status of an approved Balanced Portfolio for unintended consequences,
  – SPP may recommend RECONFIGURING an approved Balanced Portfolio.
  – Such recommended reconfigurations would be subject to SPP Board approval.
Questions???