The Old vs. New Planning Paradigms: A Dilemma for Economic Upgrades

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The Old (Current) Paradigm

- Responsive (upon request) Sequential Planning
  - Reliability upgrades over next 10 years
  - GI from new generation needed to meet resource adequacy upon request
  - Transmission service from new generation to load upon request
- Economic Upgrades are viewed as projects that result in a more economic use of the transmission grid.
  - Upgrades that are added to the system that meets the above reliability conditions
  - Economic reduction of congestion
    - E.G., substitution of coal fired generation for natural gas fired generation
  - Adjusted PC savings occurred on a zonal basis (not region-wide)
Basic Principles for Economic Upgrades
Under the Old Paradigm

1. Benefits must be measurable in dollars for economic upgrades to be included.
   - Qualitative benefits may play a role on upgrades that are on the margin, but in general, benefits must be measurable in dollars in order to be comparable to the costs of the upgrades.

2. All economic upgrades must prove to be cost beneficial: Benefits > Costs
   - Economic projects must be cost-beneficial overall, BUT
   - If for a given cost allocation an set of economic upgrades is not cost beneficial for a state, then either that set of upgrades or that cost allocation will be rejected.

3. Benefits from upgrades are measured as ones that are added to a reliable transmission system under the old paradigm.
   - Difficulty with adding market-based resources that don’t meet the old paradigm; e.g., trapped generation.

A.2  The New Paradigm - ITP

• Possible Futures for Cost-Effective, Long-Term Planning
  – Renewable Energy Mandates (RPS/RES)
    • Wind Generation, Solar, Bio-Mass, Kinetic Hydro
    • Energy Efficiency and Demand Response
  – Carbon Legislation
    • Carbon Capture and Sequestration
    • Nuclear Generation
    • Distributed Generation
  – Air Quality
  – Smart Grid
  – Price Sensitive Demand
  – Electric Transportation
  – Electric Storage

• Proactive Planning
  – Focus on Deliverability of Energy to the Market
    • Benefits are Regional, Not Local
  – Deliverability to Load in other markets vs. Renewable Energy Credits (RECs)
  – Need to know state’s expected plans under alternative futures
Impact of New Paradigm on Economic Upgrades

• Currently, economic upgrades provide very specific benefits as measured by adjusted production costs.
• Should these types of upgrades be thought of in a different way in order to be considered within the context of a highway rate; i.e., within the context of ITP?

Do economic upgrades improve deliverability from a set of potential resources to the market?

Economic Upgrades Within Deliverability of Resources?

• Deliverability to the SPP Market
  – An upgrade can improve deliverability from generation resources to the SPP market.
    • Generally this means that lower cost power whose dispatch is restricted because of transmission constraints is now able to be dispatched more fully.
  – However, the cost-beneficial principle still applies:
    • If the cost of the transmission upgrades exceed the savings from expanded dispatch, the result should be called “uneconomic deliverability.”
Improving Deliverability

• **Basic Deliverability** is the deliverability required in the Aggregate Study process to obtain long-term firm transmission service.
  - SPP applies contractual dispatch to determine base case power flows.
  - A new DR is then input into the power flow analysis and the “most expensive” DR of the load in the contractual dispatch is backed down.
  - This analysis is performed in an Aggregate Study context that applies this basic analysis to all transmission service requests.
  - Upgrades required by violations are then determined and must be added in order for the DR to be deemed deliverable to the load.

• **Improved Deliverability** can be thought of in terms of the ability of the transmission system to deliver energy from a Resource to a Load in such a way that the differences in the LMP at the Resource and at the Load (congestion costs) are lower when compared to basic deliverability.
  - The closer the LMPs at the Resource and Load, the more improved is the delivery.

Note: Improved Deliverability can also be thought of as deliverability to the market: G→M.

GI→M

(Generation Interconnection + Improved Delivery to Load)

Step 1: Provide GI→L (interconnection combined with basic deliverability) analysis as a foundation.

Step 2: (G→M) Add to basic deliverability a set of upgrades that will improve deliverability, subject to a cost benefit test; e.g.,

\[ CC_{After} - CC_{Before} > \text{Cost of Upgrades} \]

Step 3: Include these economic upgrades in the total package of upgrades that are funded through the Highway/Byway mechanism.
Dilemma for Priority Projects

• G→L: Can easily be included in a Highway/Byway rate, but
  – Missing the ITP context: This may not be a problem if stakeholders can agree on where to put upgrades for wind GI requests.

• Economic: Old metrics go with old paradigm and we have no cost allocation available, but
  – If G→L projects are approved, then using new metrics to improve delivery could work.

Questions for SPT

• Should priority projects focus on G→L and then consider economic upgrades for improved delivery to the market?
  – If so, the CAWG can go forward with the Highway/Byway rate design for priority projects.
  – If not, where should the CAWG turn its attention with respect to cost allocation?