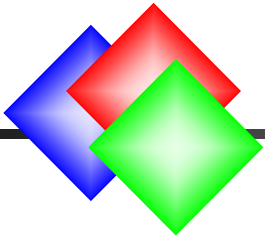


Beyond Standard Market Design:



Comments of
Steven L. Walton

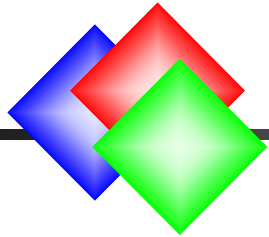
Harvard Electricity Policy Group
Atlanta, Georgia
April 3, 2002



Questions Posed:

- ◆ What degree of connection, expansion and operations “Socialization” is acceptable?
- ◆ How are existing transmission rights to be treated?
- ◆ What alternative forms of financial transmission rights will succeed?
- ◆ How can model acceptance delay be compressed?
- ◆ How will the existing seams be addressed?
- ◆ How are revisions to occur to correct problems uncovered in implementation?

“System expansion, whither goest thou?”



- ◆ The Classic Model—Vertical Integration
 - ◆ Combined generation, transmission, distribution and customer service decisions made by the firm
 - ◆ Components not individually priced for evaluation
- ◆ The New Model—Competitive Generation with Independent Transmission Operation
 - ◆ Load Serving Entity (LSE) plans for obligations and acquires an energy supply portfolio
 - ◆ Generators make competing supply offers
 - ◆ Transmission cost is an external cost component paid by either buyer or seller



The “Classic” Expansion Process

- ◆ Load growth forecast
- ◆ Resource options identified, e.g.,
 - ◆ Build local generation
 - ◆ Build mine mouth generation and transmission
 - ◆ Build transmission and make a wholesale purchase
- ◆ Resource selected based on “least cost”
 - ◆ Equivalent alternatives compared
 - ◆ Energy cost—land, generator plant investment, labor, fuel, fuel transportation, cooling water, regulations for clean air and water
 - ◆ Transmission cost—right of way, incremental lines and substations, losses
- ◆ “Used and Useful” investment oversight



A New Expansion Process

- ◆ Load growth forecast by LSE
- ◆ LSE responsible for its resource portfolio
 - ◆ Separately priced components for energy and transmission
 - ◆ “Least cost” supply options:
 - ◆ Demand side and distributed resource options
 - ◆ Hub or source purchases (buyer pays transmission cost)
 - ◆ Delivered energy purchases (seller pays transmission cost)
 - ◆ Both supply risk and price risk considered
- ◆ Regulatory oversight of portfolio adequacy?



Paying For New Transmission

- ◆ The question: How much cost is for the “common good” and how much benefits to specific parties?
- ◆ Transmission expansion driven by generation siting should affect the price of energy from that source
 - ◆ Interconnection as an “impact fee” paid up front
 - ◆ Congestion cost from SMD prices delivery cost
 - ◆ Congestion relief subscription projects requires long-term rights provisions beyond SMD
- ◆ Some expansion costs that are difficult to target and may require common funding
 - ◆ Generalize load growth in a region
 - ◆ “Best use” of transmission corridors



A Decision Making Process

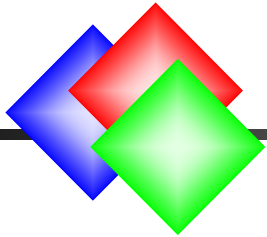
- ◆ An RTO planning regime needs a open making decision process and dispute resolution procedures
 - ◆ Process elements:
 - ◆ Open planning process to informs participants and anticipates need
 - ◆ Known design standards and cost responsibility guidelines
 - ◆ RTO Board role to decide “split the baby” cases
 - ◆ Dispute resolution w/appeal to FERC
 - ◆ A general rule cannot foresee fact specific problems
- ◆ Regional variation needed
 - ◆ Geography and topology matter for both technical design practice and identification of causal relationships



Nature of Transmission Rights

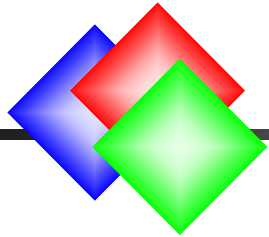
- ◆ Existing transmission rights
 - ◆ Defined by injection-withdrawal rights from specific points in the network
 - ◆ Point-Point – from PORs to PODs include individual buses and trading hubs (COB & Mid-C)
 - ◆ Network – from network resources to load buses
 - ◆ Service was shaped and had optionality
 - ◆ Network followed load
 - ◆ Alternative, mutually exclusive PORs and PODs
 - ◆ Recognition of diversity provided additional services
- ◆ New financial rights
 - ◆ Source-Sink pairs
 - ◆ Fixed strips of rights

Problems Encountered in Converting Existing Rights



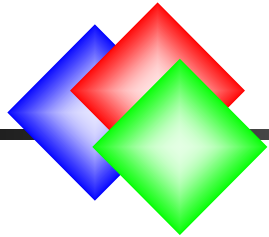
- ◆ The easy part -- mapping locational characteristics
 - ◆ From POD, POR, network resources, area loads
 - ◆ To injections and withdrawals at nodes, hubs, load zones.
- ◆ The hard part – matching optionality characteristics
 - ◆ Over commitment occurs if existing rights are converted to full strips of financial rights
 - ◆ Occurs because seasonal and load diversity is ignored
 - ◆ Use of pro rata reductions to resolve over commitment causes a cost shift due to altered protection for unchanged usage
 - ◆ Yet the physical system is able to accommodate the use of existing rights without substantial congestion cost
 - ◆ An approach needed which takes advantage of diversity

Adaptation for Conversion: Catalogued Transmission Rights



- ◆ The RTO West proposal pools existing rights as Catalogued Transmission Rights (CTRs)
 - ◆ Catalogue prepared codifying existing rights
 - ◆ Obligations: (1) injection and withdrawal points, (2) limits on simultaneous usage (3) timing restrictions
 - ◆ Assets: Provided by PTOs to honor issued rights such as remedial action schemes, redispatch calls, etc.
 - ◆ Obligations versus assets tested to see if system capacity plus provided assets is adequate to honor the aggregate of existing commitments
- ◆ RTO West proposal releases additional system capacity as Financial Transmission Options
 - ◆ CTRs compress exiting rights to maximize FTO release
 - ◆ Provision made for those with CTRs to release to auction by early exercise of optionality

Model Acceptance and Implementation



- ◆ A fable: The contest of the sun and the wind
 - ◆ The challenge: Who could get a man to remove his coat the blowing wind or the warming sun?
 - ◆ The moral: Force triggers resistance while desirable features carry the day
- ◆ Stage Implementation
 - ◆ Fundamental features:
 - ◆ Nodal pricing of congestion, imbalance, losses
 - ◆ Build experience with pricing and settlements
 - ◆ Allow reasonable adaptation for conversion of existing rights
 - ◆ Avoid fights over fixed cost recovery, there are no winners here
 - ◆ Expand energy market as understanding grows
 - ◆ Resolution of generation adequacy standards – (1) nature of requirement, (2) required level and (3) enforcement process
 - ◆ Add pool purchases as market understanding grows and fear of run-away prices declines



The Remaining Seams

- ◆ Getting to a “single market”
 - ◆ Doesn't require single operator
 - ◆ Span of control considerations for reliability
 - ◆ Diminishing return with increasing scale
 - ◆ The key issues – (1) operational timing of markets and schedules, (2) loop flow and transmission rights, (3) fixed cost charges at boundaries
- ◆ A possible approach to phased implementation
 - ◆ Establish common scheduling practice
 - ◆ Start-up each RTOs systems using physical rights at interface
 - ◆ Synchronize day-ahead and real-time pricing
 - ◆ Institute common transmission rights auctions