



Addressing Congestion Rent Shortfalls

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TOPICS

- FTRs and Revenue Adequacy
- Market Impacts of FTR Shortfalls
- FTR Shortfalls and Simultaneous Feasibility Test Design

An important property of financial transmission rights is “revenue adequacy.” When there is congestion under locational pricing, the differences in locational prices will cause the ISO to collect congestion rents.

- Congestion rents, not auction revenues are intended to fund payments to financial rights holders.
- Revenue adequacy means that the congestion rents the ISO collects in charges for congestion using LMP pricing will be sufficient for the ISO to pay financial transmission rights holders the full congestion rent differential, regardless of the actual usage of the grid.

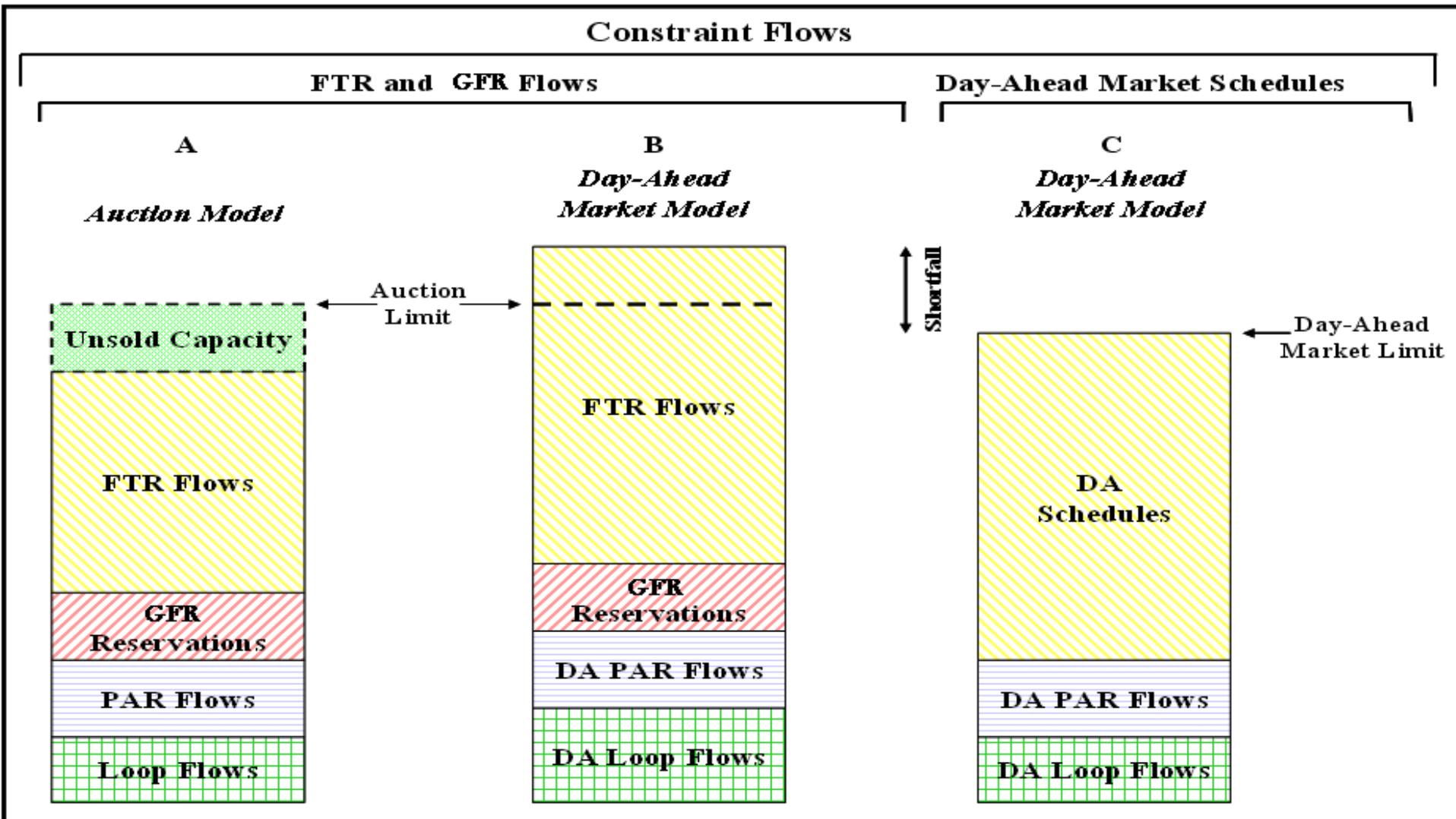


REVENUE ADEQUACY

A congestion rent shortfall exists when the congestion charges in the day-ahead market do not generate enough revenues to pay FTR holders the full congestion rent differential between the FTR sink and source.

- A congestion rent shortfall can arise if the awarded FTRs are not feasible on the day-ahead market or real-time grid or if congestion charges are not collected on all schedules that create flows on binding constraints.

Congestion Rent Shortfalls in the Day-Ahead Market





REVENUE ADEQUACY

Congestion rent shortfalls in the day-ahead market can arise from a number of sources:

- Transmission outages in the day-ahead market not modeled in FTR allocation/auction.
- Differences in load zone nodal weights between day-ahead market and the FTR allocation/auction model.
- Greater loss flows on constraints in the day-ahead market than modeled in FTR allocation/auction.
- Greater loopflows modeled in the day-ahead market than modeled in FTR allocation/auction.
- Differences in PAR flows between day-ahead market and FTR allocation/auction model.



REVENUE ADEQUACY

- Differences in limits on internal constraints between the FTR auction and the day-ahead market.
- Differences in modeling of entitlements on external constraints between the FTR allocation/auction and the day-ahead market
- Differences between modeling of grandfathered rights in FTR allocation/auction and day ahead market schedules.
- Constraints enforced in day-ahead market that were not modeled in FTR allocation/auction.
- Shift factor truncation in the calculation of congestion charges in the day-ahead market.
- Regulatory awards of FTRs that exceed the transfer capability of the grid.



REVENUE ADEQUACY

Analogous differences between the transmission system modeled in the day-ahead market and real-time operation can lead to congestion rent shortfalls in real-time settlements.



REVENUE ADEQUACY

Not all unfavorable differences in limits or loopflows on binding constraints result in congestion rent shortfalls.

- Unfavorable changes of one type may be offset by favorable changes of another type.
- Unsold capacity on a constraint in the auction serves as a buffer against congestion rent shortfalls.



REVENUE ADEQUACY

While financial transmission rights such as FTRs, TCCs and CRRs are financial instruments, it is important to not lose sight of the fact that financial transmission rights are entitlements to the use of the physical electric grid that are defined in financial terms to avoid the economic inefficiencies and adverse liability impacts of physical transmission rights.

- The design of financial transmission rights is therefore driven by the characteristics needed to support investments and long-term contracts for generation and transmission while providing efficient incentives for generators to participate in economic dispatch and congestion management.



REVENUE ADEQUACY

The equivalent of congestion rent shortfalls exists outside RTO regions when firm transmission rights and native load entitlements to use of the transmission system are not feasible in real-time.

These infeasibilities are manifested in

- Curtailments of firm transmission service
- Out of merit dispatch costs borne by utilities in serving their native load

As with financial transmission rights, infeasibilities in firm transmission rights can be managed by under selling the transmission system. However, because firm transmission rights are sold at prices based on embedded cost, overselling the transmission system and occasionally incurring out-of-merit dispatch costs can be profitable.



REVENUE ADEQUACY

In the Midwest, prior to implementation of the MISO's economic dispatch in April 2009, the availability of transmission service was so restricted that real-time post contingency flaws on the monitored element were often less than 25% of the limit on constraints that were fully scheduled day-ahead or hour-ahead.



SHORTFALL IMPACTS

Most of the sources of congestion rent shortfalls are simply cost shifts; eliminating the cause of the congestion rent shortfall would shift costs but not change the overall cost of meeting load.

In some instances however, the factors contributing to congestions rent shortfalls may also increase the overall cost of meeting load.

- Inefficient transmission outage scheduling
- Non-optimal par schedules



SHORTFALL IMPACTS

Transmission outages and deratings reduce the transfer capability of the grid and can therefore make awarded FTRs infeasible on the day-ahead market grid, creating the potential for congestion rent shortfalls.

- Transmission outages that create congestion rent shortfalls raise the cost of meeting load as well as creating cost shifts.
- There is no perfect way to account for transmission outages in FTR allocation and auction processes that avoids shortfalls. The vast bulk of the outages that lead to shortfalls cover only a small portion of the auction or allocation period, and their timing is often subject to change.



SFT ASSUMPTIONS

The omission of constraints that will bind in the day-ahead market from allocation/auction SFT models is a particular problem.

- Auction participants will identify these constraints and can acquire large infeasible FTR positions in the auction at low cost because there is no constraint to drive up the price.
- Lowering transmission limits in the SFT does not reduce the award of infeasible FTRs but reduces the award of feasible FTRs on other constraints, creating offsetting congestion rent surpluses.



SFT ASSUMPTIONS

The magnitude of congestion rent shortfalls depends, in part, on the assumptions that an ISO makes in running the simultaneous feasibility test for FTRs.

- The more conservative the assumptions used in running the simultaneous feasibility test for FTRs, the fewer FTRs will be sold and allocated, which will generally reduce the congestion rent shortfall impact of transmission maintenance outages, loopflows, and other modeling issues.
- Reducing the number of FTRs awarded can reduce or eliminate the net congestion rent shortfalls associated with maintenance outages but does not reduce their social cost (the increase in the cost of meeting load) and does not avoid cost shifts.



SFT ASSUMPTIONS

Reducing the number of FTRs awarded or prorating payments to FTR holders also reduces the ability of load serving entities to use FTRs to hedge congestion charges.

- Excessive reductions in the number of FTRs awarded or high proration levels can inefficiently skew investment decisions toward contracting for or building local rather than remote generation to serve load.
- Conversely, making up congestion rent shortfalls from other revenue streams would overstate the hedge provided by transmission and could inefficiently skew investment decisions toward remote generation to serve load.



SFT ASSUMPTIONS

Because FTRs are simply congestion hedges and FTR ownership is not necessary to use the transmission system, the use of more conservative assumptions to allocate and auction FTRs would not raise the cost of meeting load.

- Unduly conservative assumptions, however, would reduce the ability of load serving entities to hedge their use of remote generation to meet load.



SFT ASSUMPTIONS

Conversely, if marginal FTRs are sold at prices reflecting a risk discount, rather than risk premium, to expected day-ahead market payments, then reducing the proportion of the transmission system available to support the award of FTRs would not adversely impact the ability of load serving entities to hedge congestion costs.



SFT ASSUMPTIONS

Assessing the extent to which FTRs sell at prices reflecting a risk premium or a risk discount is complicated by several factors.

- Actual day-ahead congestion charges are highly variable and may not reflect expected charges even when averaged over a period of time.
- Auction prices reflect time value of money impacts.
- If FTR payments are prorated due to shortfalls, the unpredictability of proration levels will also cause actual and expected payments to diverge.
- The existence of a risk premium or discount may not be uniform over all source sink pairs on which FTRs are sold.



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