

Dynamic Transmission Losses in LMP Markets

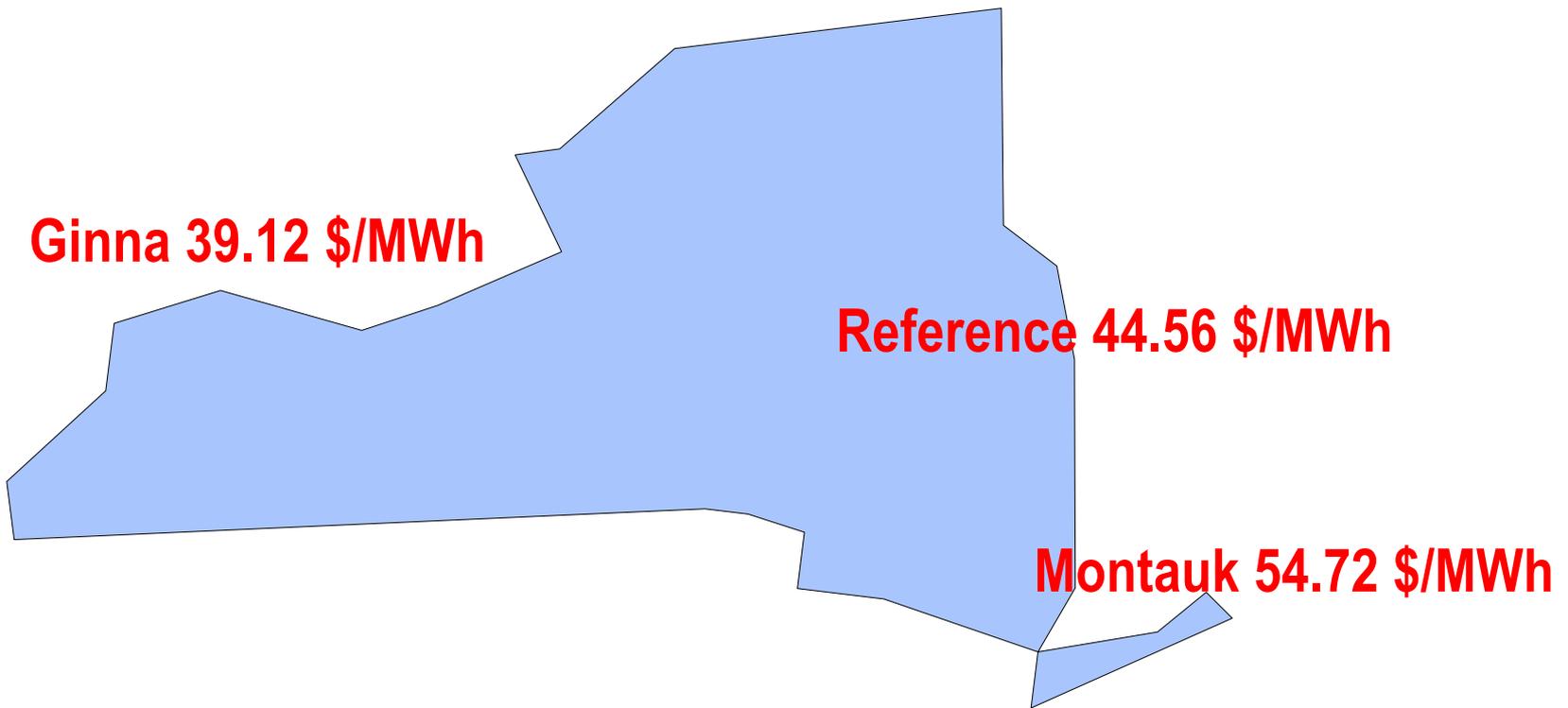
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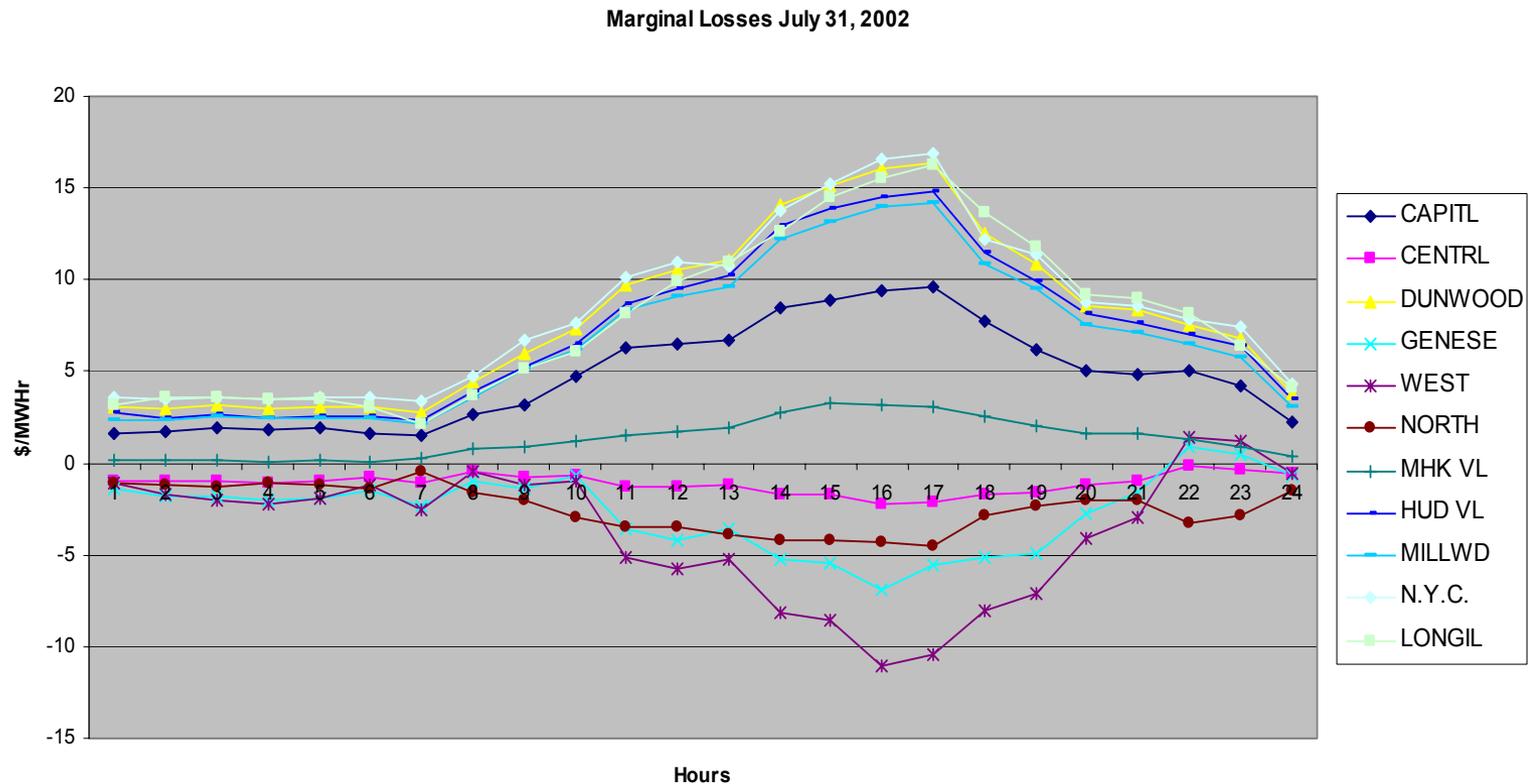
PG L. The Value
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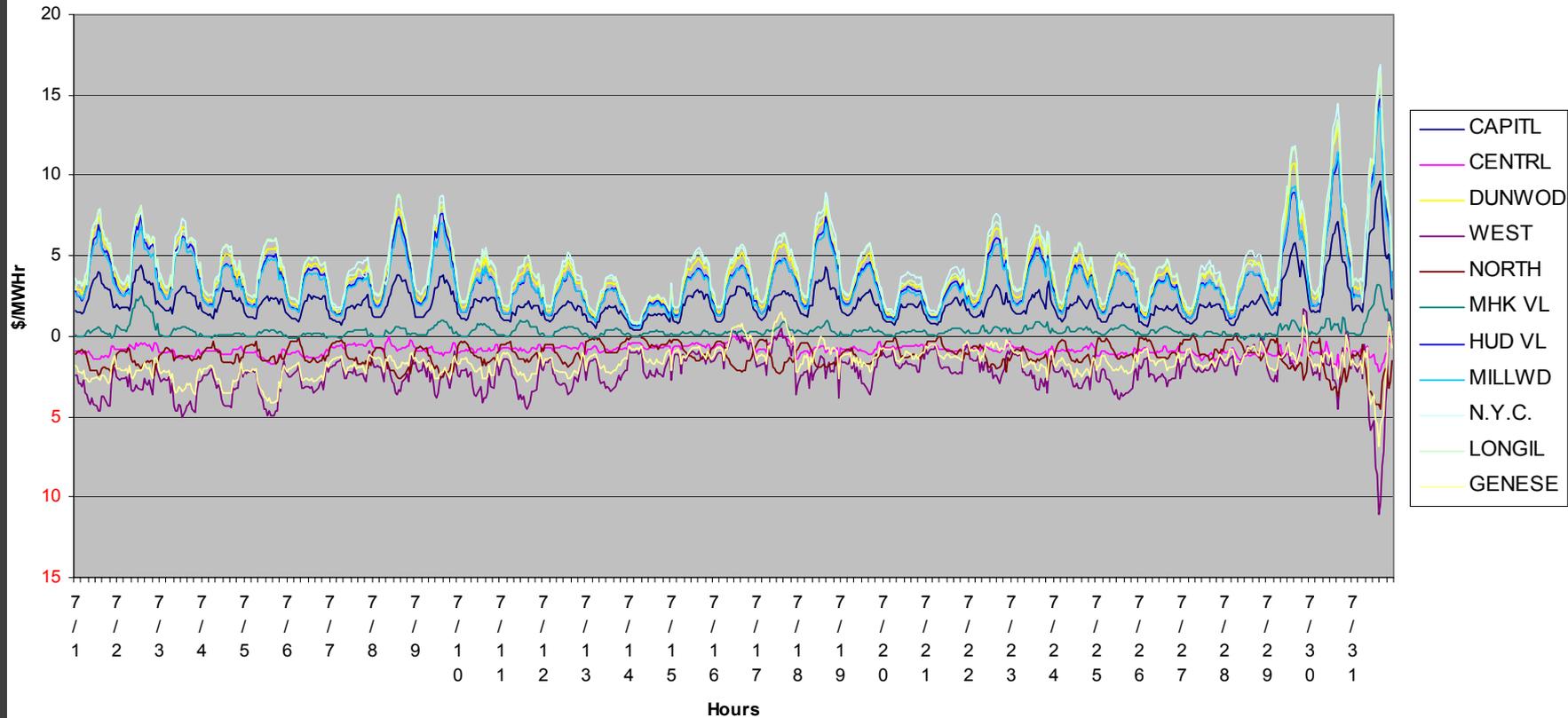
- Transmission Losses
 - Sample actual prices from New York on July 1st, 2001
 - No congestion in the hour
 - 40% delta in prices solely due to losses!



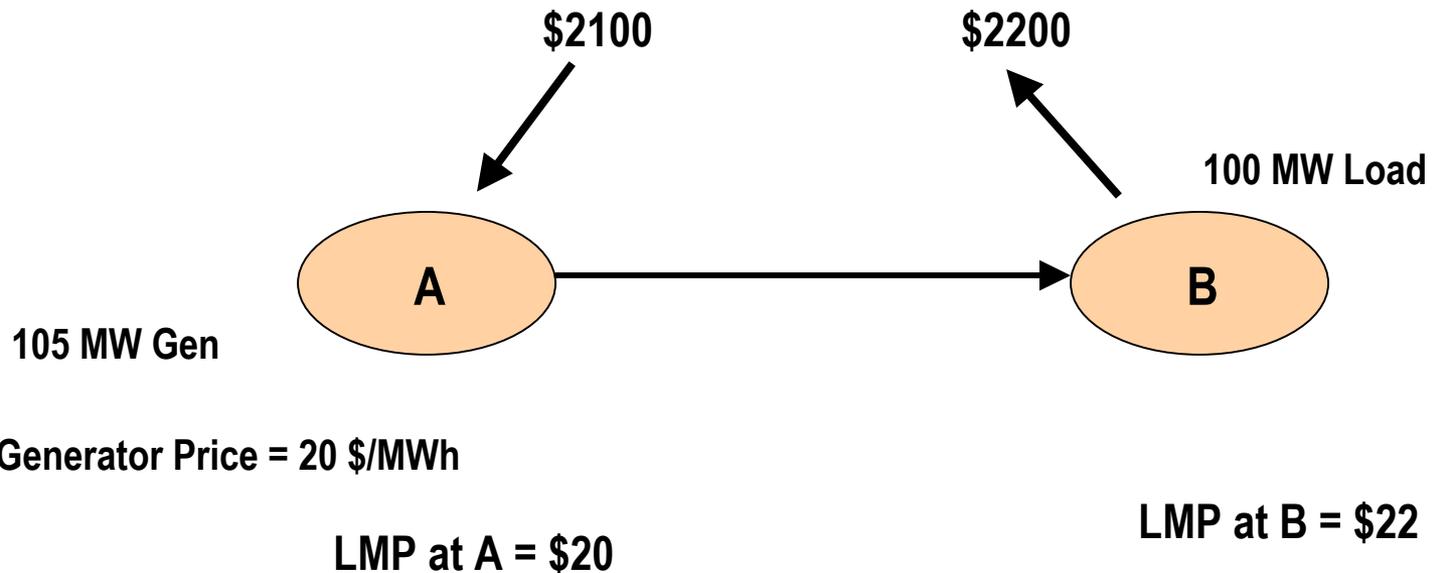


NY ISO Actual Marginal Losses – July 2002

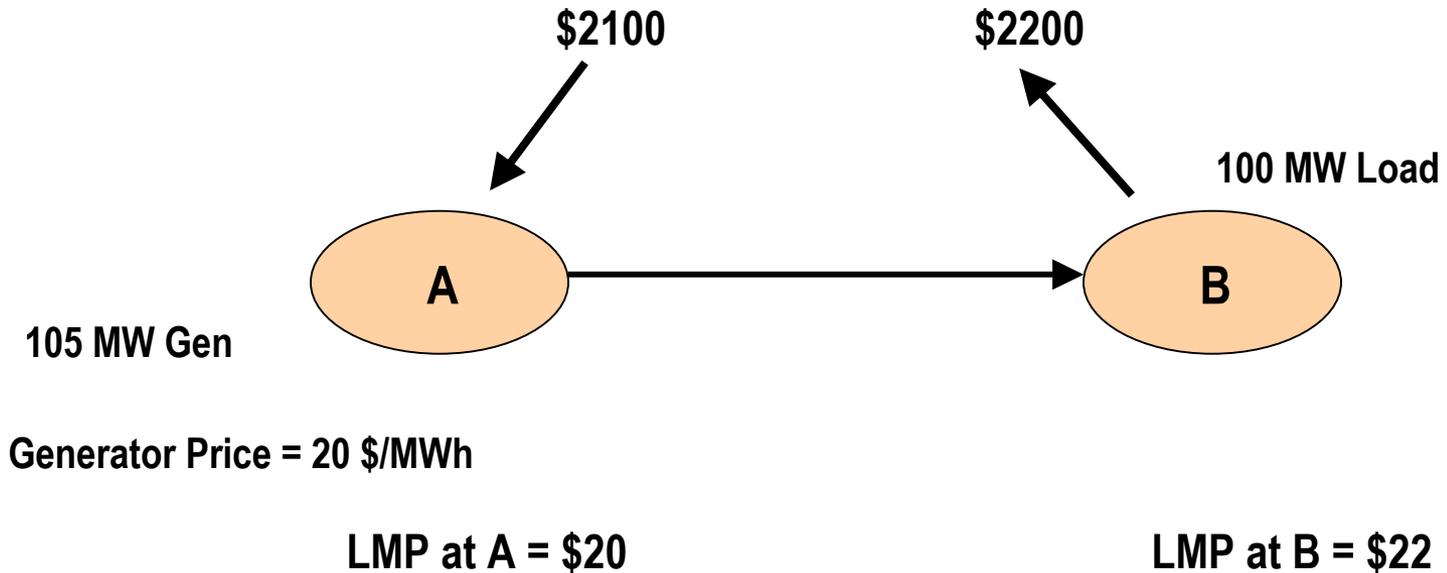
Marginal Losses July 2002



- Let's assume losses = $.0005 \times (\text{flow into B})^2$
- Then marginal loss rate = $.001 \times (\text{flow into B})$
 $= .1 \text{ MW}_{\text{losses}}/\text{MW}_{\text{flow}}$
- $\text{LMP}_B = \text{Price of Marginal Generator} \times 1.1$
 $= 20 \times 1.1 = 22 \text{ \$/MWh}$



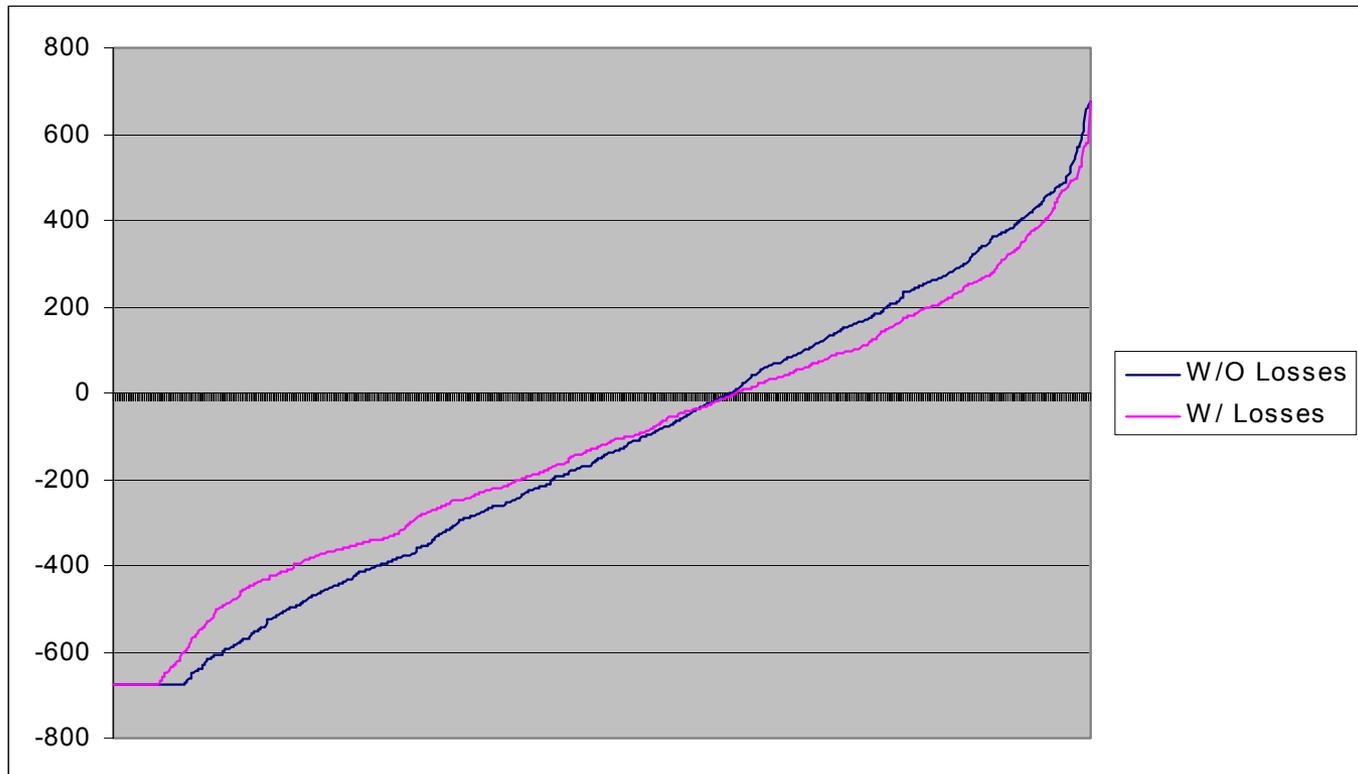
- Over-collection of loss revenues
 - Who gets the difference?
 - (For congestion, the difference goes to the holders of FTRs)
 - Typically allocated back to load customers as offset of transmission service charge
(Socializes losses over loads, leaves generators exposed)



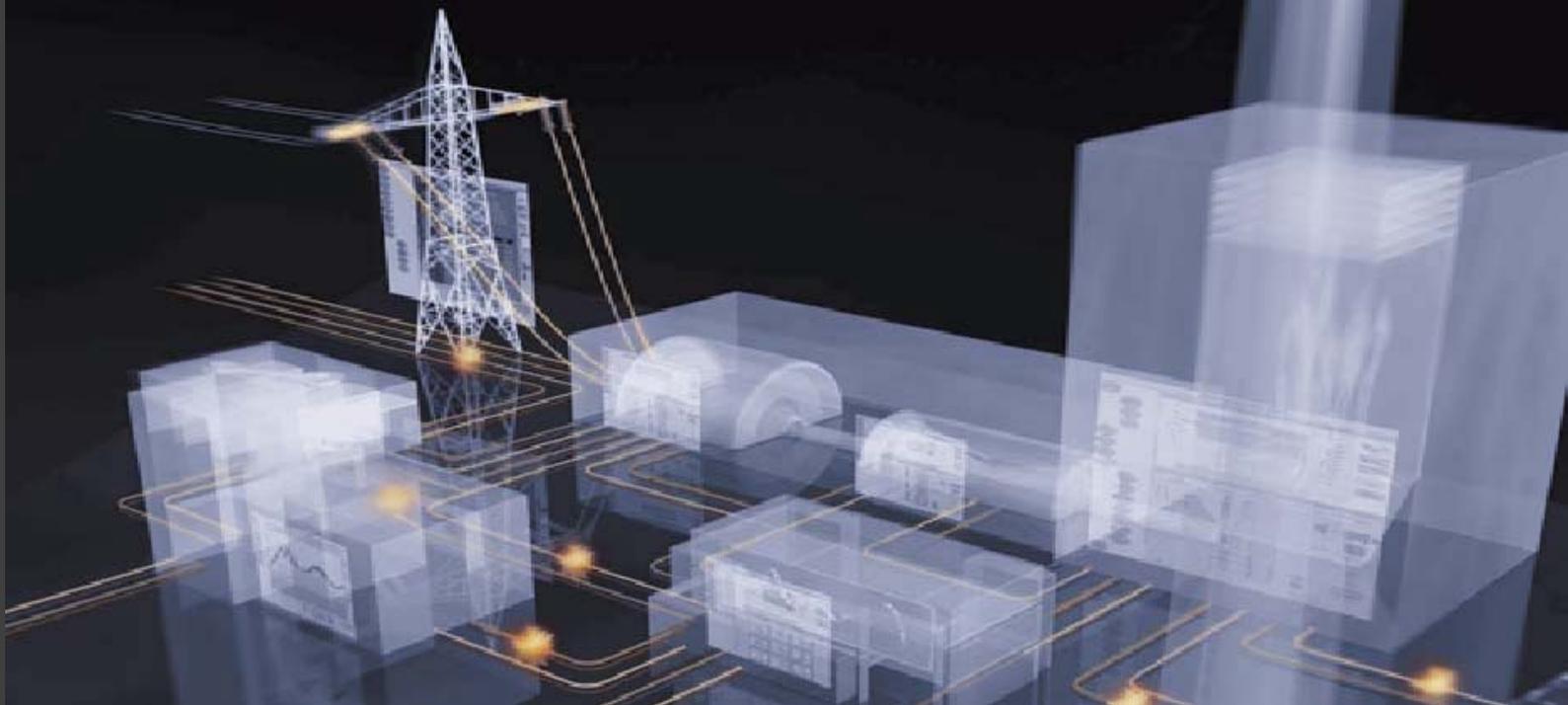
- Reduce flows due to price penalty

ERCOT North/South Interface Flow Distribution:

PROMOD IV Simulation for July 2004



- Price marginal remote generation out of the market
- Additional dimension to price volatility
- Potential unanticipated re-allocation of costs over customers
- Improves locational price signal for new loads and generation



Existing Contracts in Transmission Planning

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- Remote/Joint-Owned Generation
 - Owned resources
 - QF
 - Merchant
 - Unit Purchase
- Wholesale Load
- Bilateral Contracts

- FERC Tariffs
 - Tedious to discover details
- Form 1
 - Gives general historical quantities
 - Difficult to discern dispatchability, price, term, etc.

- Do they affect system economic dispatch?
 - Out-of-merit dispatch
 - Market incentive to adopt economic dispatch
- Bypass hurdle rates across seams?
 - May affect economic transfers
- Just a hedge against spot prices?
- Should transmission be planned around uneconomic transfers that bypass the market?

- Self-schedule, with hedge for actual congestion
- Convert to “equivalent” FTR
- Buy out uneconomic contracts
 - Stranded cost treatment of QF contracts

- Assume existing contracts just represent hedges
 - Market incentives enforce economic scheduling
- Existing Contracts only affect portfolio value of holder
 - LMPs, transmission flows are unaffected
- In a transparent coordinated market, value of transmission and energy resources are reflected in spot prices.