

RTO Overview and Day 2 Markets

LPSC Technical Conference

March 1, 2011

Agenda

- RTO “Day 2” markets and Locational Marginal Pricing (LMP)
- Why RTO Day 2 markets may benefit Entergy’s customers
 - Quantifiable benefits
 - Qualitative benefits
- Costs of RTO Day 2 market participation
- Common misconceptions about RTO Day 2 markets

“Day Two” Market

- Central region-wide markets operated by RTO
 - Day ahead unit commitment
 - Real time balancing market
 - Integrated ancillary services markets
- Requirement for generators to schedule or bid into the market
- Use of LMP to price use of the transmission grid – congestion charges replace “first come, first served” transmission service
- Financial transmission rights (FTRs) to hedge congestion
- Conversion plan for all load serving entities to assure existing rights are protected
- Market monitor for all RTO-operated markets

Called “Day Two” market because many RTOs did not start with this market structure

- ***PJM, ISO NE, MISO, NYISO have Day Two markets***
- ***But NYISO is only RTO that started with one***

Why Would A Day Two Market Make A Difference?

- Currently, we don't have coordinated generation dispatch in our region
 - Entergy commits its units; Cleco commits their units; IPPs make their own decisions based on their view of markets and availability of transmission
 - OATT transmission service is “use it or lose it”
 - Each participant's actions can affect others – and cause a suboptimal result
- In a Day Two market:
 - One central unit commitment and dispatch, based on economics of generation and transmission – more efficient
 - Participants can make their own decisions, but the effect will be reflected in LMPs – if you create congestion, you pay for it
 - Transmission rights are financial rather than physical
 - Vertically integrated utilities can run their own units when that is lower cost and buy from the market when that is lower cost
 - Energy and capacity costs for customers should be no higher – and likely lower – than today

What is Locational Marginal Pricing?

- A method for pricing energy at every bus on the system
 - generator busses
 - distribution substations
- Visible, transparent prices published by RTO
- Definition of LMP: the cost to the system operator of serving a (hypothetical) increment of load at that bus, taking into account all generator bids and system conditions
- LMPs are the basis for an integrated energy market and congestion management system.

FTR Overview

- Financial, not physical
 - no rights needed to schedule
 - holders get financial credit regardless of whether they schedule
- Defined like transmission service
 - quantity (MW)
 - duration
 - Direction – point to point or point to zone
- Issued by RTO – allocated to firm customers and/or auctioned

Benefits of Day Two Markets

- Enables reliable region – wide generator commitment and dispatch at lowest cost
 - Including ancillary services (e.g. op. reserves)
 - Fully integrate IPPs into regional dispatch
- Maximizes economic use of the grid
 - Use price signals, not ATC (available transmission capacity) and TLRs (transmission loading relief), to manage use of the grid
 - Redispatch happens “automatically”
- Sends efficient price signals for generator siting

Why Might Day 2 Markets Be of Particular Value in this Region?

- Generation ownership/control is dispersed in this region – Day Two market can improve the efficiency of the dispatch
- RTO Day 2 market will be larger than this region alone -- economies of scale particularly in ancillary services
- Larger market can also result in increased load diversity – combined with a Day Two market, can bring lower reserve margins

Qualitative Benefits

- Transparency
- Additional resource planning options/flexibility
- Independence

Potential Costs

- Administrative costs
- Loss of transmission revenues
- Transmission cost allocation

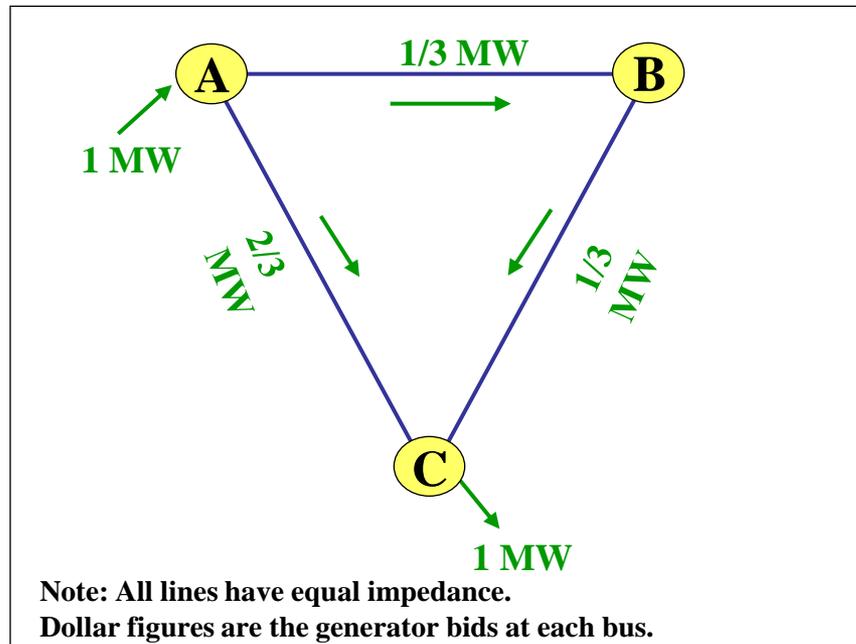
Common Misconceptions about Day 2 Markets

- Allows regulated utilities to price their generation at market
- Only needed for retail choice

Appendix

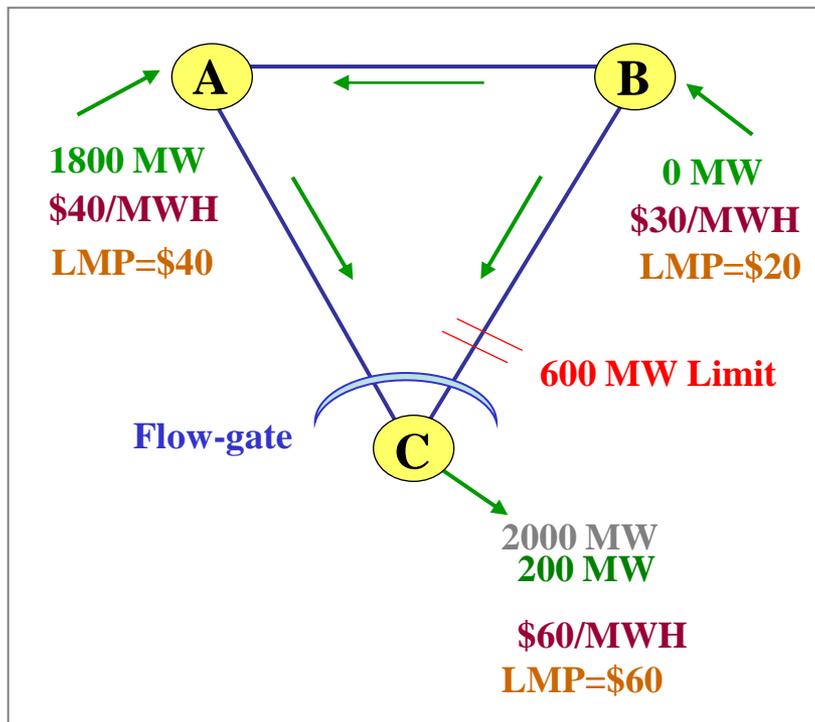
Network Effects Complicate the Congestion Problem

- Parallel flow means that electricity will flow over all interconnected lines between source and sink. Electricity flows do not follow contract paths.



Locational Marginal Pricing (LMP)

LMP Example



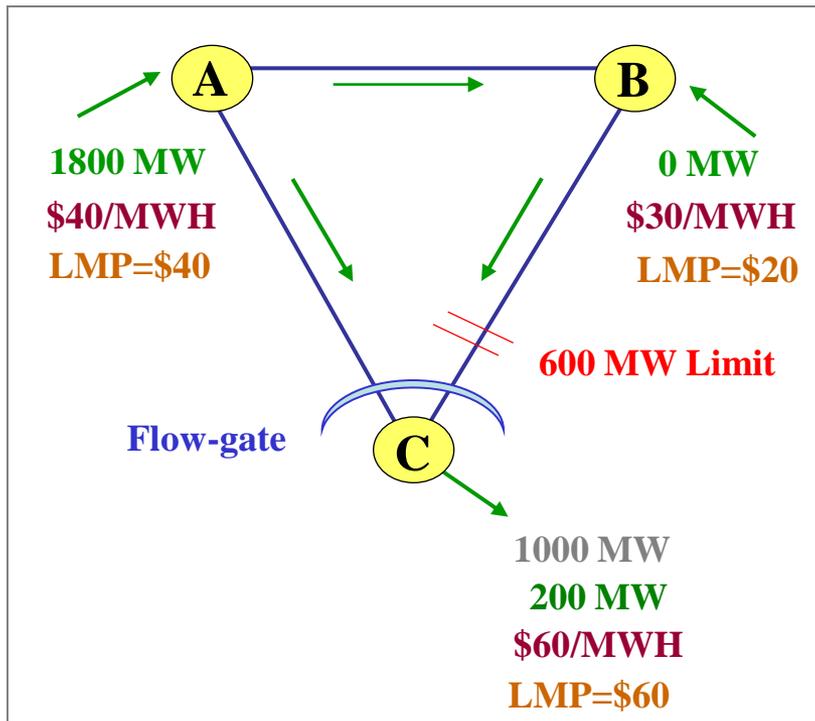
Cost to serve load

- 1800 MW @ \$40 = \$72000
- 200 MW @ \$60 = \$12000
- Total = \$84000

Other feasible dispatch

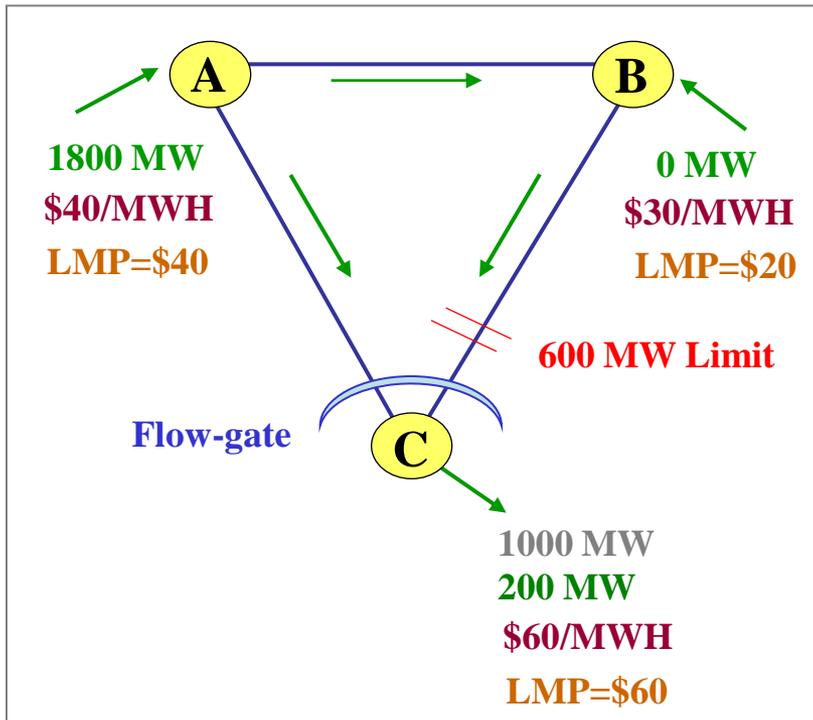
- 1798 MW @ 40 = \$71920
- 1 MW @ 30 = \$30
- 201 MW @ 60 = \$12060
- Total = \$84010

Congestion Pricing Example



- Two ways to transact:
- Schedule bilaterally, pay congestion charge for transmission
 - A to C = \$20/MWH
 - B to C = \$40/MWH
- Transact in LMP market, with congestion reflected in spot price
 - Buy/sell at A (\$40/MWH)
 - Buy/sell at B (\$20/MWH)
 - Buy/sell at C (\$60/MWH)
- Congestion is charged in both
- Structure is designed to be neutral between the two.

FTRs Provide a Hedge Against Congestion Charges



- FTR holders paid difference in LMPs
 - A – C paid \$20/MWH
 - B – C paid \$40/MWH
- Paid whether schedule power or not
- FTRs issued must be feasible
 - 900 MW B – C
 - 1800 MW A – C
 - but not both

FTRs and Price Certainty

- FTRs provide delivered price certainty for transacting parties



- If the seller holds the FTR, it receives the price at B
- If the load holds the FTR, it pays the price at A
- This is true whether the party transacts in the bilateral market or central LMP market
- This is true even if the congestion is “negative.”