



The Virtues of A Virtual RTO

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Mirant

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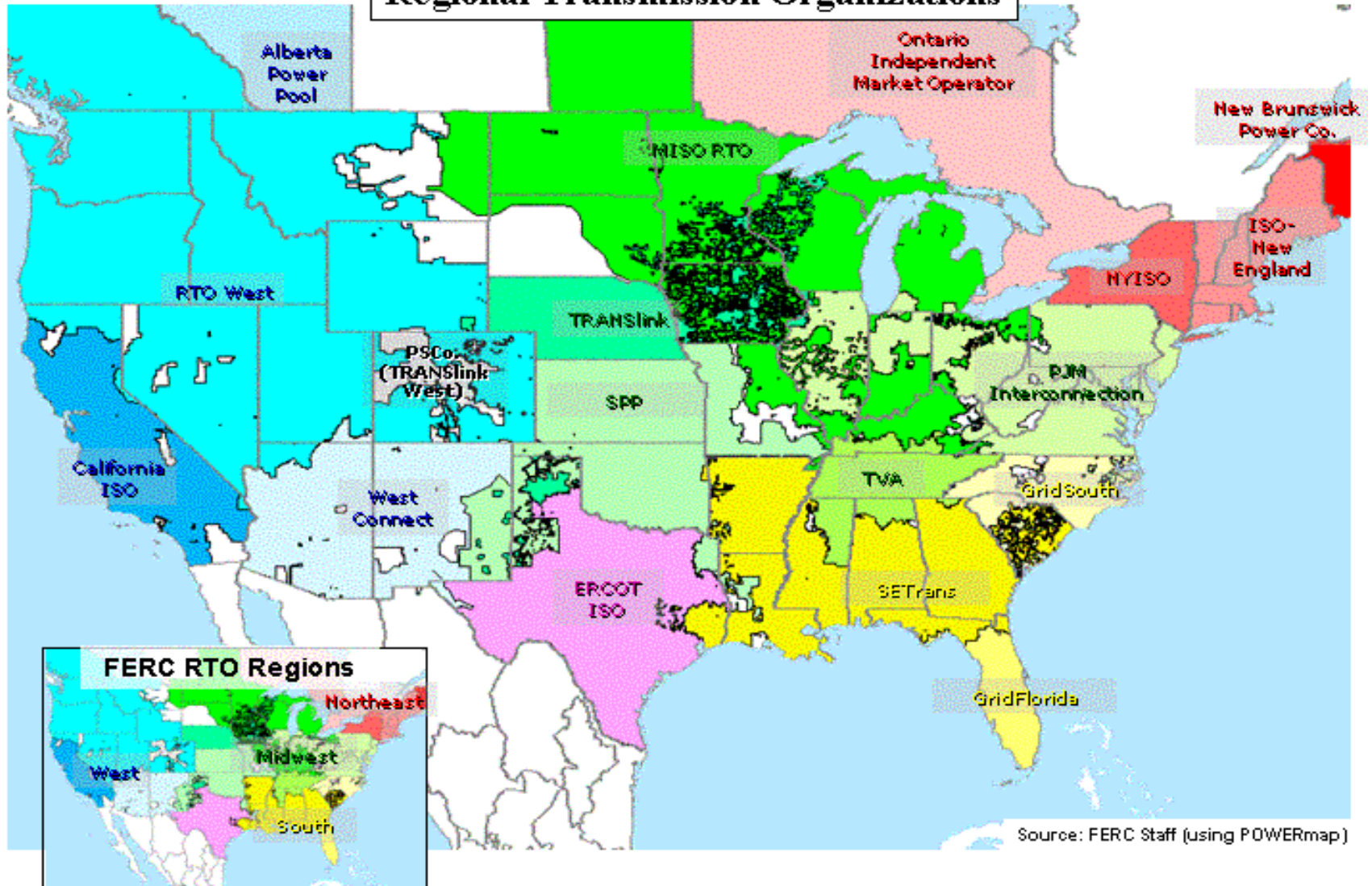
Harvard Electricity Policy Group

A Virtual RTO?

- **An Organization That is a RTO in All but Name? Minimum Attributes?**
 - Regional Security Coordinator-Single OASIS
 - Congestion Management Using a Bid Based Security Constrained Economic Dispatch Process with Locational Nodal Pricing
 - LMP-Or is There Some Other Financial Settlement Process?
 - Operates a Central Real Time Spot Energy Market
 - Coordinates Seams-Loop Flows and Moves to Operate With and Monitor a Joint Congestion Dispatch with Neighboring Regions
- **Other Elements to Include for Consideration?**
 - Day Ahead Energy Market-Congestion Rights-FTR
 - Mitigation-Market Monitoring
 - Regional Tariff-Elimination of Rate Pancaking-Export Charges
 - Virtual Regional Dispatch
- **What Now Exists--What Might be Feasible?**

What We Have in Various Stages

Regional Transmission Organizations



Who Can Coordinate with Whom and How?

Existing or Possible

NY-NE-PJM

**RTO/ISO-
with LMP**

Security Constrained
ReDispatch-provide
Shadow Prices



Nodal LMP Pricing-
Incorporate Shadow
Prices in ReDispatch

NY-NE-PJM

**RTO/ISO
with LMP**

MISO

**RTO
Developing**

Physical TLR



Internal
Redispatch-
TLR at
Interfaces

PJM

**RTO
with LMP**

West

NON ISO

PTP -Physical
Scheduled
UnScheduled
Flows



Internal Zonal
Balanced -Schedule
Flow Relief at
Interfaces

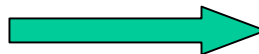
CAISO

ISO

All Others But Tx &
SPP

NON ISO

PTP -Physical
TLR/Unscheduled
Flows



PTP -Physical TLR
Unscheduled Flows

NON ISO

A Pragmatic View - For Regional Cooperation

- **A National Market with Regional Differences**
 - The RTO Concept--The Pluses?
- **The Practical**
 - Next Steps for NE-NY
 - What of PJM & MISO?
- **The Political**
 - California-Governance & Functional Market Rules
 - The South & the Northwest-Can We Accommodate SMD & Regional Interests?
- **The Possible**
 - Regional RTO Heavy-NE-MidAtlantic-Midwest-SPP-West Connect
 - Single State RTO-ISO Hybrid-NY -California-Florida
 - Minimal Regional Standards for South-Northwest
 - Real Time System Administration Role for the New Electric Reliability Organization (ERO)?

SMD--*There Were Some Positive Points*

- The Reality of the Interconnection Reliability Requirements for the Eastern and Western Regions of the USA
- An Independent Central Security Coordinator Role Overseeing Competitive Energy Markets
- Relieving Congestion-Reliability Issues- Through an Integrated Security Constrained Economic Dispatch Management System-Spot Energy Market
- Wholesale Price Transparency--Market Liquidity for Efficient Pricing
- Optimize Savings Through Joint Operating Rules and Business System Commonality
- Increase Incentives for Regional Transmission and Generation Expansion
- Regional Market Monitoring and Market Efficiency Optimization

A Regional Virtual RTO-The Minimum Features?

Independence

- Governance
- Independent Entity Running Real Time Operations of the Grid

Operational Authority

- One Regional Security Coordinator for the Grid

Short-Term Reliability

- ERO Standards & Enforcement
- Security Constraint Regional Unit Commitment and Economic Dispatch

Congestion Management

- Elimination of TLR
- A Real Time & DA Energy Market
- Congestion Hedges

Centralized OASIS with TTC/ATC

Market Monitoring

- Regional with Commonality in Mitigation Rules

Interregional Coordination

- Seam Identification & Resolution
- Elimination of Export Fees-
Regional Through & Out Fees

Parallel Path Flows

- Identification & Monitoring

A Harvard Professor's Warning*

➤ The Separation Fallacy “California Dreaming”

- Operation Oversight Only
- An Energy Market Only
- The Enron Legacy
 - Balanced Energy Schedules do not Guarantee Reliability
 - An Energy Market Alone will not Provide Price Transparency & Market Liquidity

➤ Integrated Regional System Operations

- A Central Coordinated Regional Congestion Management System
- Bid Based Security Constrained Economic Dispatch
 - Real Time Locational Nodal Prices That Are Transparent & Liquid
 - Combining Short Term Reliability ReDispatch with Nodal Pricing Allows an Incentive for the Market to Provide the Feasible Solution Rather than a Central ISO Operator

➤ [*Avoiding The Separation Fallacy: Comments by Dr. Hogan before the FERC, RM01-12, March 12, 2002](#)

The Practical Landscape

➤ The Northeast-New York Markets

- NE-NY-PJM has Shown the Successful use of LMP Pricing with Respect to Transmission Congestion Management & Short Term Reliability
- NE has the Ability to Converge on an Operational-Financial Basis Many Joint Market Functions with New York Including a Capacity Market
- Virtual Regional Dispatch May Provide Some of These Synergies
- Elimination Of Export Fees- A Market Advantage to NE Consumers \$21 Million Savings to NE-\$12 Million Loss to NY Consumers; Possible Uplift Through a Seams Elimination Cost Adjustment (SECA) Mechanism
- Virtual Regional Dispatch has Significant Opportunity for Consumer Savings for Economic Transfer of Generation Between the Two Regions*
- Modest Production Cost Savings in Economic Dispatch *

➤ *D.Patton Presentation to NY Structures Working Group-ISO NE Markets Committee, September 11, 2003

Virtual Regional Dispatch -Joint Operations and Obstacles to Success

➤ Governance

- Tariff Differences
- Export Charges
- Scheduling Rules
- Auction -Allocation of FTR
- Credit Requirements
- Mitigation Measures
- Uplift Allocation & Make Whole Provisions

➤ Virtual Regional Dispatch

Is the RTO/ISO Taking a Market Position in the Real Time Energy Market to Optimize it or to Achieve a Desired Outcome?

➤ Operational

- Joint Models-Joint Scheduling
- Node Identification & Dispatch
- Ancillary Market Requirements
- Timing of Settlements
- Proxy Busses to External Flowgate Monitoring
- Virtual Bids-Shadow Prices & ReDispatch Determinations

➤ Nomenclature-Using the Same Terminology

The Practical Landscape

➤ MISO

- The Existing Regulatory “Limbo” With Respect to the Old “Alliance” Companies is Preventing the Ability of MISO to Move to an Integrated Operating Model
- Regional Footprint has Some State PSCs with Opposite Positions With Respect to Transmission Owner Membership in RTO
- The Worst of Two Worlds-No Real Time Centralized ReDispatch-No Real Time Regional Coordination Among 23 Control Areas
- FERC Must Decide on the Status of AEP-Commonwealth Edison in the MISO-PJM Market if a LMP Type Market is to Occur
- Elimination of Through & Out Rates is a Concern With Respect to Uplift Among Differing Transmission & Load Entities
- Ability of MISO Members to Withdraw & Transmission Companies (ITCs) with Differing Layers of Responsibility a Concern

Where We Really Need A Virtual RTO

➤ PJM-MISO Coordination

– MISO Region is Contractual Rather Than Electric Topological

- Between PJM and MISO They Have Identified Over 300 Flowgates That Have an Impact on Each Other
- Integration of Commonwealth Edison Into PJM Without AEP is Problematic
- Loop Flows Between Two Regions Are and Can Create Congestion Without a Corresponding Match in LMP Prices--Huge Potential for FTR Shortfall
- Market Monitoring-Many Seam Issues in Coordinating LMP Market Between Two Systems If AEP Is Not Operating Under Same Rules

– Must Move Beyond Joint Regional Coordination

- Congestion on One Impacts Another-Requires a Single Operating Market
- Can One RTO Run the Spot Energy Market for Both While Allowing for Two RTOs?

The Political

➤ FERC and SMD

- Energy Title Status and the Delay in RTO Implementation
- Administration “Voluntary” RTO Approach
- States’ Rights in the South and the West
- Governance with Respect to the California ISO

➤ RTO Heavy/RTO Light

- Reconsider National Requirements Versus Regional Demands
- Those That Want-Keep-Those That Don’t-Can We Set a Minimum Base Line?
- Can We Separate Real Time Operation/Market Requirements From Expansion Planning and Native Load Concerns?

➤ Electric Reliability Organizations-ERO

- Are They the New RTO-Light?
- Will the Imposition of Reliability Penalties Demand Real Time Regional Control?
- Beware the Separation Argument-Must Not Separate Regional Operational Control From a Real Time Congestion Management Pricing System

California

➤ The Issues

- Board of Directors and CAISO Independence Must Be Settled
- Existing and Proposed Market Design Remains Confused and Is Still Tilted Towards a Zonal-Balanced Physical Schedule Mode
- Is MDO2 a True Intent Towards Creating an Optimal Market Design to Overcome the Existing Market Mitigation Approach?
- A Restrictive Energy Cap and No Corresponding Capacity Market-How Do You Recover Long Run Marginal Cost of New Investment?
- How To Better Coordinate California and the Remainder of the West

➤ The Opportunity

- A Spot Market Using LMP Based Security Constraint Dispatch
- A Regional Virtual Dispatch Coordination With Arizona -Nevada-Northwest With Respect to Economic Dispatch
- A Regional Capacity Market to Meet Capacity Planning Requirements

Virtual RTOs in the South?

- Southern & Entergy Do Operate Many Functions of an RTO
- Each Independently Operates a Regional Joint Transmission System
 - Southern (Ga, Al, Parts of Fl, Miss)
 - Entergy (Ark, La, Parts of Tx, Miss)
- Economically Dispatch Their Units
- Joint Tariff for Their Operating Companies
- Regional Planning for Transmission Expansion

Getting Around Just Say No

➤ **Can We Get The Best Attributes of SMD**

- Open Access & Independent Oversight of Grid
- Regional Economic ReDispatch of Generation
- Operation of a LMP Spot Market in Lieu of TLR
- Regional Market Monitoring
- Is the Entergy “Weekly Procurement Process” Proposal a Start?

➤ **Can We Satisfy States’ Rights?**

- Recognition of Bundled and Unbundled Transmission Access.
- Transmission Expansion on a Participant Funding Basis.
- Regional & State PSC Oversight & Governance
- Grid Florida Status?

Non-jurisdictional

➤ TVA

- Resolution of TVA “Inside the Ring” Status
- Participation in Either MISO or PJM-Beyond the Existing MOUs?
- Develop A Spot Regional Energy Market With The Southern RTOs

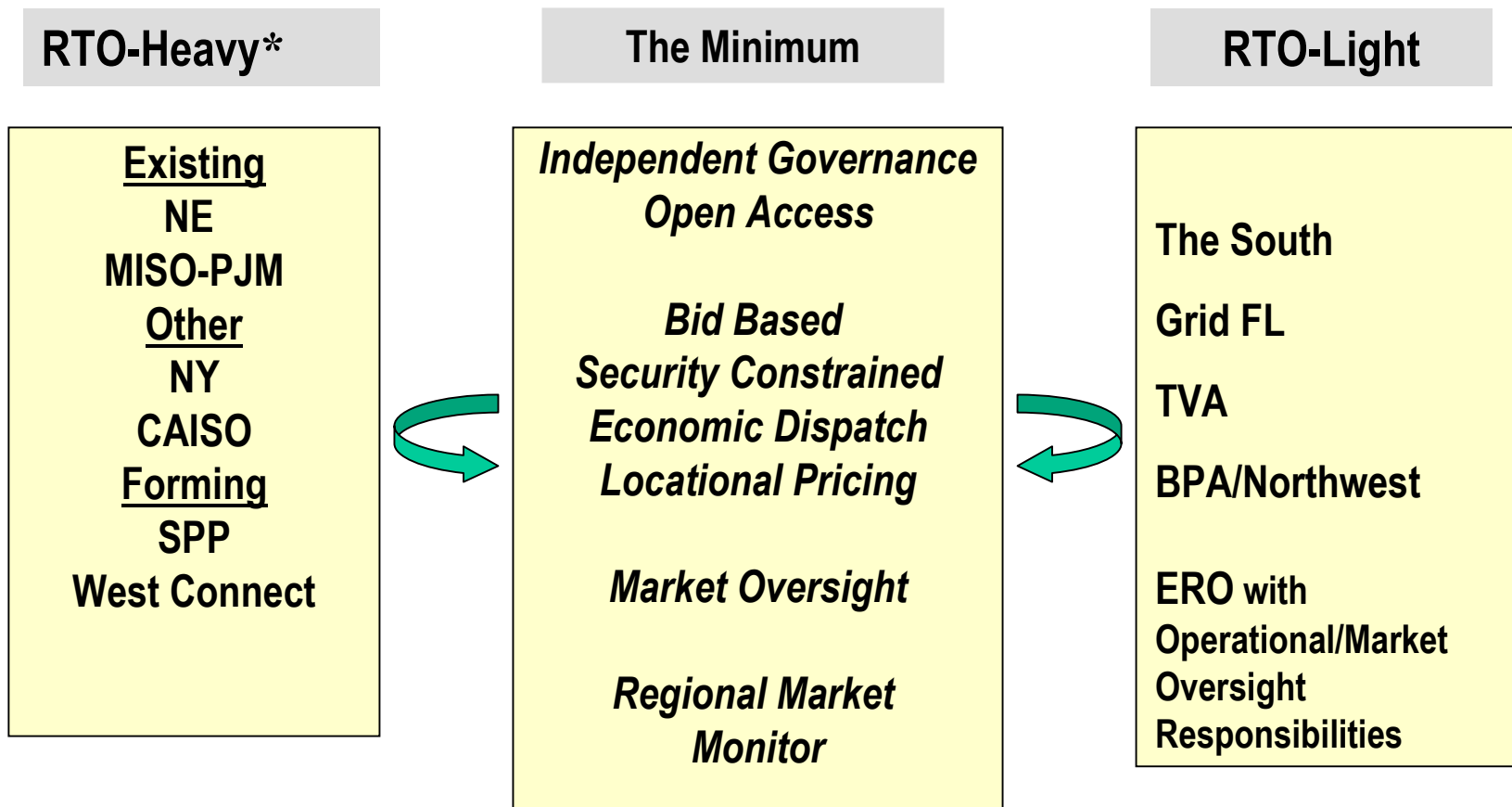
➤ BPA

- Recognize that They and PacifiCorp are the RTOs in the NW
- Overcome the “Hydro” Concern With Respect to Congestion Management
- Coordinate a Joint Economic Dispatch With California-Nevada
- Can the ERO Process Be a Way to Overcome Non-Jurisdictional Issues?

The ERO

- ERO in Lieu of NERC Regional Councils
 - Governance Changes-Funding-FERC Backstop
 - Legislation to Move to a Regulatory-Penalty Mode
 - Can You Have the Ability to Levy Penalties Without a Real Time Monitoring and Control of the Spot Market?
- NERC Recently Announced Dropping of MRD Standards for the Eastern Interconnect
 - **Stating that:** “As the Commission has surmised, a comprehensive market-based congestion management solution, such as that offered by location-based marginal pricing is a practical and effective solution and far superior to MRD for dealing with congestion”*
- **Senate Energy Title Language:** “Allows for development of and enforcement of standards that provide for an adequate level of reliability of the bulk power system.”
- A Role as a Real Time Independent System Administrator of the Markets--RTO Light?

The New Paradigm



*ERCOT--State Jurisdictional Only