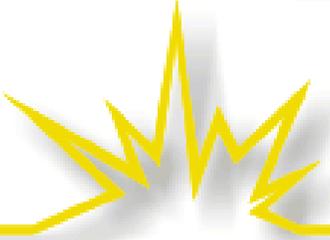


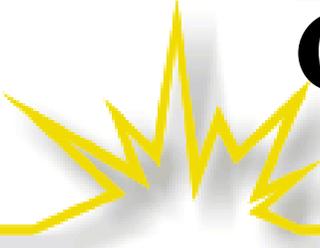
First Background Observation

- U.S. Electricity Industry
 - Cooperating, vertically integrated firms
 - Federal and Cooperative Agencies (BPA, TVA, REA and PMAs)
 - Public Power vertically integrated by contract rather than ownership



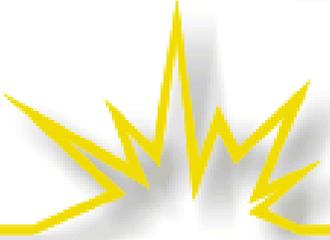
Second Background Observation

- U.K. restructuring and U.S. re-regulation and deregulation of other industries
 - Have been studied intensively
 - Now being mined for relevance to electric industry
- U.S. natural gas experience
 - Has been good experience
 - Increased confidence for electric restructuring
 - Current debate may draw too heavily on gas experience



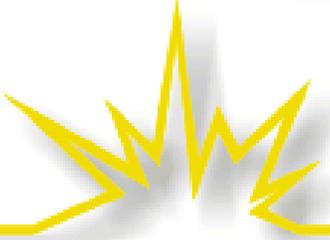
California Blue Book Orders of April 1994

- Initiated Industry Restructuring in California
- Intended to
 - Allow customer freedom of choice by
 - January 1, 1996 for large customers
 - January 1, 2002 for other customers
 - Allow "stranded cost" recovery by utilities
- Initiated formal proceedings to
 - Receive arguments (pro and con)
 - Consider modifications or amplifications of intended policies



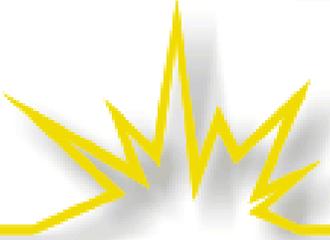
The Debate

- Two Principal models
 - POOLCO
 - Bilateral Trading



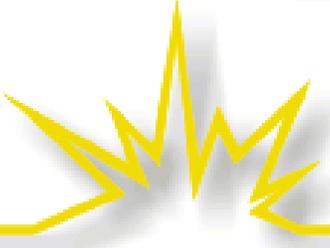
POOLCO

- Built on UK experience
- Proponents tend to rely on strong role for natural monopoly of system control to
 - Ensure efficient spot market
 - System reliability



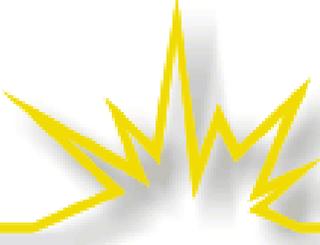
Bilateral Model

- Proponents draw on analogies to the U.S. gas experience
- Proposed to reduce roles of regulated monopolists to the bare minimum needed to ensure reliability



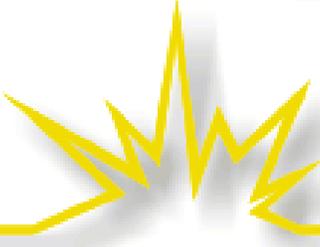
Expected Compromises

- Most regulators and industry participants seem to expect both models to be adopted
 - One part of a state may have POOLCO and the remainder a Bilateral Model
- Presents major task for federal regulators



Description of POOLCO and Bilateral Trading Models

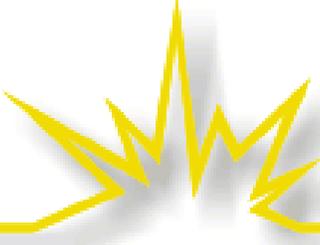
- Proponents of both models
 - Recognize need for system operator (SO) for grid operations and reliability
 - SO would have great powers in emergencies, but must operate within market constraints
 - Call for creation of "independent" system operator
 - No loyalty to any subset of generators, distribution companies or customers
 - Loyal to reliability and needs of buyers/sellers as revealed in their bargains



Description of POOLCO and Bilateral Trading Models

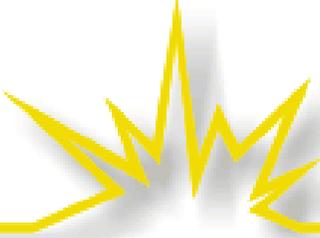
➤ Proponents of Both Models

- Recognize that both models could be
 - Limited to the wholesale power markets, or
 - Expanded to retail markets
- Require
 - Continuation of regional reliability councils to created reliability standards until
 - Implementation of regional transmission organizations (RTOs)



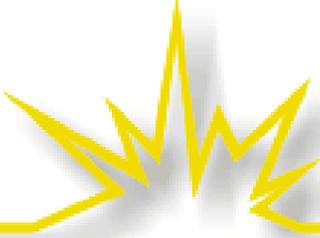
Description of POOLCO and Bilateral Trading Models

- Proponents of Both Models
 - Recognize need for RRCs to coordinate transmission planning until RTOs are created and empowered
 - Recognize need to levy demand charges for transmission access to recover costs not recovered in variable charges
 - Recognize need to empower ISO to use penalties to enforce contracts



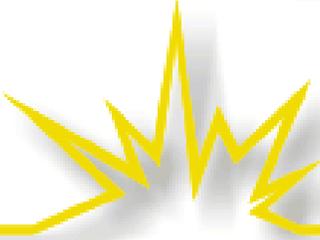
Characteristics of Mandatory POOLCO Model

- All generators/sellers schedule production on day-ahead basis
- Buyers may
 - Submit offers to purchase in the form of schedules, or
 - Delegate function to ISO
- ISO takes offers and calculates market clearing price (MCP), subject to constraint of minimizing the cost of delivered power



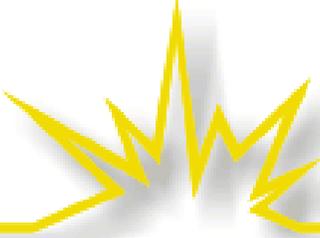
Characteristics of Mandatory POOLCO Model

- ISO notifies sellers and buyer of MCP
- ISO dispatches as scheduled in the pre-bidding process
- ISO Contracts with generators for ancillary services (spinning reserves, voltage support, etc.) to preserve system reliability
- ISO may or may not contract with users to ensure interruptibility at certain prices



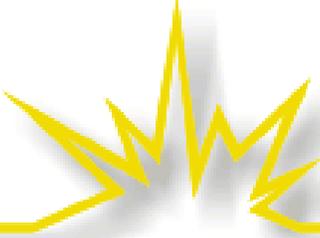
Characteristics of Mandatory POOLCO Model

- Affiliate of ISO within POOLCO will
 - Execute a clearinghouse function
 - Collect revenues from Buyers
 - Payout revenues to Sellers
 - Pay transmission owners for services
- Buyers and Sellers free to enter "contracts for differences" with one another or with any one else



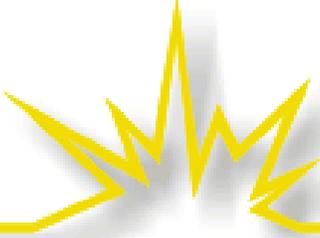
Characteristics of Mandatory POOLCO Model

- In one version of POOLCO
 - Distribution company that buys from competitive spot market commits to reselling that power to some or all users in franchised territory at spot market price (Users can also enter contracts for differences).
- In most supported versions of POOLCO
 - Transmission costs are measured by the difference in power costs between two nodes



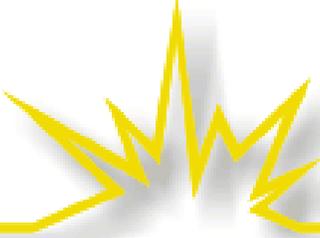
Characteristics of the Flexible POOLCO Model

- Generators, users or agents may submit offer to produce to the ISO
- Generators and users who do not want to use the ISO can
 - Contract separately for price and rates of sale and purchase
 - Must notify ISO of the quantity and location of power delivery and receipt points
 - No need to tell ISO of prices in bilateral contracts



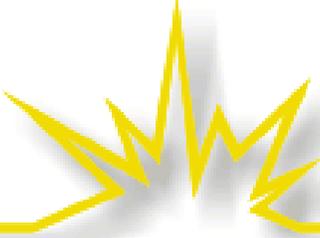
Characteristics of the Flexible POOLCO Model

- ISO dispatches all plants who participate auction to minimize costs of delivered power subject to
 - Reliability requirements
 - Obligations to satisfy the bilateral contracts that have been proffered
- ISO affiliates
 - Operates a clearing house
 - Paying MCP to generators
 - Collecting MCP plus transmission and control area services (CAS) from buyers



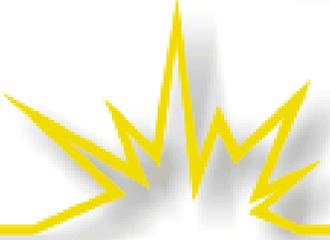
Characteristics of the Flexible POOLCO Model

- One version of model permits parties to bilateral contract to
 - Choose delivery point for title transfer
 - That choice determines who pays the transmission charges



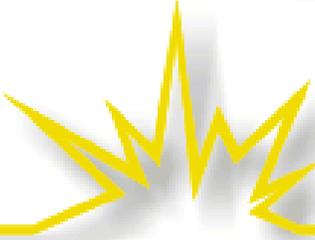
Characteristics of the Flexible POOLCO Model

- One version of model permits ISO to serve as an auctioneer who
 - Does not take title to power (except balancing and reliability related services)
 - Discovers and reveals the MCP
 - Dispatches plants to minimize cost of delivered power of those who participate in the auction
 - Settle financial transactions
 - Preserve reliability



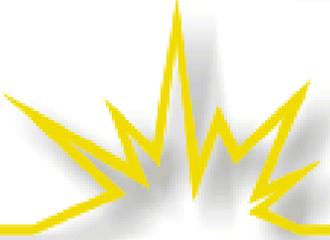
Characteristics of the Bilateral Model

- In most versions
 - ISO Is limited to preserving reliability and buying CAS
 - ISO Does not bring parties together (left up to parties)
 - Rules allow parties to bilateral contracts to furnish required CAS to ISO rather than purchase from ISO
 - Private parties are free to organize spot or other markets, within limits of antitrust laws



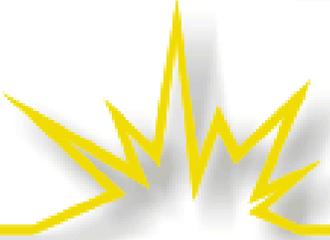
Key Issues in the POOLCO Versus Bilateral Model Debate

- Two overlapping issues are
 - Opposition to government regulations per se
 - Relationship of ISOs and spot markets for power
- Efficient bilateral long-term contract markets require short term "spot" market to "fine tune" transactions
- Balancing services serve needs of large buyers and sellers reasonably well, but may or may not serve small users as well



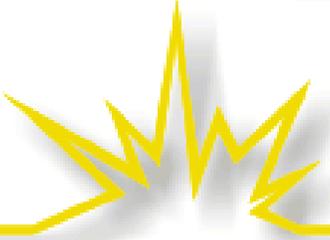
Governance Problem

- When two utilities or generators interconnect
 - Each lose sovereign control over economic performance
 - Cooperation is essential for efficiency



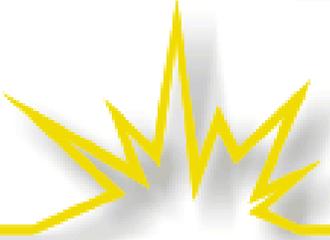
Four Illustrative Cases

- Case One: Isolated, mandatory POOLCO model
- Case Two: Isolated, flexible POOLCO system
- Case Three: Interconnected POOLCOs
- Case Four: (The realistic case).
Interconnected control areas
 - Some are regulated by one regulator
 - Others regulated by one or more different regulators



Conclusions

- Rampant externalities involved in operating within interconnections
- Everyone's actions affect everyone else (often dramatically)
- Chaos is only reasonable expectation if rules and standards not honored



Conclusions

- What is new is not that coordination in operations is needed but fact that
 - Number of players will be much larger
 - Motivations of key players, especially generators and large users, will be different from those who influenced grid-use policies and practices of the past