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EQC Energy Subcommittee Presentation on Power Marketing and Delivery Basics

Joel D. Cook
Director, Marketing and Trading
PPL EnergyPlus
(406) 533-3500
jdcook@pplmt.com

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Part 1 - Western Power System Background

Part 2 - Power Marketing Functions

Part 3 - Factors That Influence Power Prices

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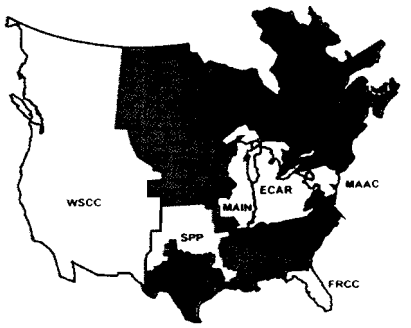
NERC REGIONS



FERC, NERC, WSCC

- **The Federal Energy Regulatory Commission (www.ferc.gov)**
  - Regulates the transmission and sale of oil, natural gas and electricity in interstate commerce
  - Licenses and inspects private, municipal and state hydroelectric projects - oversees related environmental matters
  - Administers reporting and conduct of jurisdictional companies
- **The North American Electric Reliability Council (www.nerc.com)**
  - Voluntary organization that promotes the reliability of the electric supply of the US, Canada & parts of Mexico
  - Made up of 10 regional councils
- **The Western Systems Coordinating Council (www.wscc.com/main.html)**
  - Provides the coordination that is essential in operating and planning a reliable and adequate electric power system for the western part of the continental United States, Canada, and Mexico
  - Largest NERC reliability region - in western US, Canada & northern Baja Mexico

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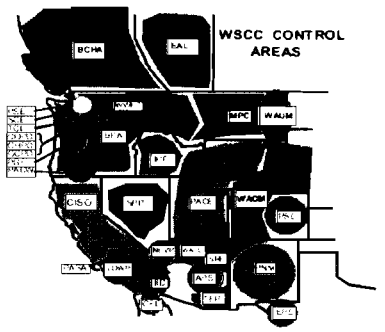
WSCC (WECC) Control Areas



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Control Area

- An electric power system bounded by interconnection tie line metering & telemetry in which an AGC performs the following reliability functions:
  - Matches generation, capacity & energy purchases to load
  - Maintains scheduled interchange with other Control Areas
  - Maintains the frequency of the electric power system
  - Provides sufficient generating capacity to maintain operating reserves

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meter that allows a control area to know how much electricity is coming in and how much is going

* 60 cycles per second

Open Access
-The Transition Begins-

- Created and regulated per FERC Orders #'s 888, 889 & 638
- Order #888
  - Promotes wholesale competition through open access non-discriminatory transmission service by public utilities
    - Develop cost based transmission tariffs
    - Functional Unbundling
    - Comparability
  - Recovery of stranded costs
- Order #889
  - OASIS - Business Practices & Functional Specifications
  - Standards of Conduct
- Order #638 - Clarification of Business Practices & Functional Specifications
  - On-Line Price Negotiation for Transmission through OASIS
  - Standardized Path Names & Terms

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Highway System Proposed

3 Proposed RTOs in the West

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RTOs

Regional Transmission Organizations - Created and regulated per FERC Orders #s 2000 & 2000A - To promote competition in wholesale power markets by eliminating transmission-related barriers between power sellers and buyers. -

- Four Characteristics
  (1) Independence, (2) Scope & Configuration, (3) Operational Authority, (4) Short-term Reliability
- Three Western RTOs - at this time
- RTO West will encompass the Montana System
- RTOs should enhance wholesale competition by:
  - Eliminating rate pancaking (across systems)
  - *Providing equal access to grid by all participants*
  - *Simplifying Transactions*
- *Expected result will be lower costs and increased reliability*

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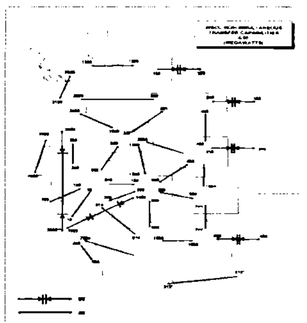
WSCC Transfer Capability



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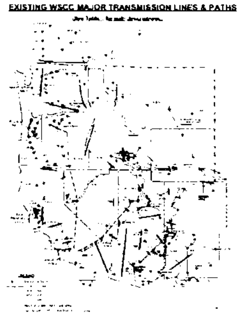
Congestion

FIGURE 2
EXISTING WSCC MAJOR TRANSMISSION LINES & PATHS



Many Transmission Paths are Bottlenecked or "Congested"

Congestion management is a significant issue in RTO rule design

Existing Firm Transmission rights are also an issue in RTO design filings

name plate = generator is capability to produce

Montana Generation

OWNER		Total Montana Nameplate	% of total	Montana Gen in the WSCC Nameplate	% of total
Bureau of Reclamation		728	14	[illegible]	15
Montana Power Co		241	5	241	5
PPL		1358	26	1358	28
Montana-Dakota Utilities Co		127	2	0	0
PacifiCorp	Colstrip	160	3	160	3
Portland General Electric	Colstrip	311	6	311	6
Puget Sound P&L	Colstrip	747	14	747	15
USBIA	USBIA-Mission Valley Power	0	0	0	0
USCE	USCE-Missouri River District	186	4	0	0
USCE	USCE-North Pacific Division	525	10	525	11
Avista	Colstrip/Noxon	699	13	699	14
State of Montana	Broadwater	10	0	10	0
Colstrip Energy LP	Montana 1	42	1	42	1
Yellowstone Energy LP	BGI	65	1	65	1
Stone Container		11	0	11	0
Hydrodynamics	South Dry Creek	2	0	2	0
other COGEN/SPP	est	4	0	4	0
		5216	100	4904	100

Source: EIA

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Mid Columbia Hydro Generation

Drainage	Installed Capacity	Average Generation	Firm Generation	Runoff
Mid-C	13265	8730	5800	11000
Lower Snake	3490	1750	1400	2300
Lower Columbia	6640	3750	3065	6000
Total	23595	12230	10265	19300

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Part 2 - Power Marketing Functions

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Physical Commodity Market

There are three distinct markets:

- Real Time
- Pre-Schedule
- Term

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Real Time

Hourly Responsibilities (7X24)

- Transactions sizes vary as necessary to balance loads and resources
- Short lead time to respond
- Generation monitoring and forced outage management
- Economic dispatch of all resources including purchased power
- Hourly load management, loss, and resource balancing
- Hourly transmission procurement and power scheduling
- Response to transmission outages, curtailments, and interruptions

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Pre-Schedule

Responsible for trading & scheduling next day - 3 month term

- Typically transact using standard products in blocks of 25 MWs
- Narrow (4 hour) trading window each morning prior to transmission scheduling deadlines
- Generation, load, and transmission prescheduling
- Daily transmission procurement, tagging, and power scheduling
- Short term market analysis

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Term/Wholesale Marketing

Long-Term Transactions from pre-scheduled to multiple years in length

- Products are usually structured to a particular customers needs (i.e. shaped, options etc.)
- Ample time to negotiate a desired price
- Less volatility and less liquidity over time
- Requires long term market analysis

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Transmission Management

- Execution and management of all transmission agreements
- Management of all transmission rates and tariffs
- Transmission route planning
- Congestion management and re-routing
- FERC, NERC, WSCC, NWPP monitoring and compliance

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Resource Coordination

- Management of hydro coordination agreements (PNCA, MRCA)
- Generation forecasting, planning, and maintenance coordination
- Compliance with operational and reporting requirements of plant licenses
- Compliance with provisions of the Generation Interconnection Agreements
- Development of optimized plant operating strategy including operating reserves, and water management
- Participation in the Emergency Action Plans

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Risk Management and Pricing

- Price Discovery and Curve Construction
  - Forward price discovery
  - Curve construction & product pricing
  - Capture and manage historical prices
  - Monitor natural gas forwards/historical data
- Risk Management
  - Assist in the development and application of the Risk Program
  - Identify and desegregate components of transactions
  - Perform mark-to-market on the commodity portfolio
  - Report risk measures to management

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Contract Administration

Two primary contracts utilized (WSPP & EEI)

- Western Systems Power Pool
- Edison Electric Institute
- Allows power sales & exchanges with
  - Maximum of flexibility
  - Minimum of regulatory filing
- Standardized default contract for wholesale electricity sales
  - Power sales, exchanges and physical options
  - Over 220 WSPP members
  - WSPP is the most commonly used standardized agreement in west

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Accounting

- Provide accounting and financial support to PPL entities for energy transactions and activities in the Western Region.
- Functions
  - Settlements
    - Physical - Counterparty checkout, closing, invoicing, voice recording verification
    - Financial - Counterparty checkout, accounting determination and disclosure
  - Accounting
    - Wholesale Trading transactions; G/L entries for financial derivatives, G/L entries for revenues, expenses, etc.; reconciliations of Balance Sheet accounts
    - Document, settle, record, retail sales

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Part 3 - Factors that influence price

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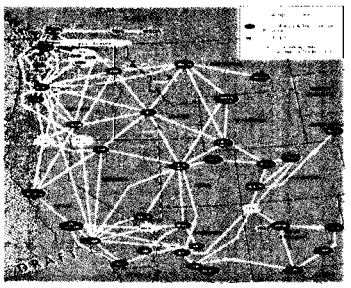
WSCC Market/Trading Hubs



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Yellow = Trading Hubs

Mid-Columbia Market Hub

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Mid-Columbia Defined

- Two Federal projects have large impact in the area
- 118 miles of Columbia River
- Liquid Power Trading Point
  - -Geographically Near Montana
  - -Transparent Pricing Information
- DJ Mid-Columbia Index = Avg. of Transactions from the following delivery points:
  - Columbia
  - Midway
  - Rocky Reach
  - Wells
  - Wanapum

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Northwest Markets

- Prices based from Mid-Columbia Market Hub
- Historical prices available in peak and off-peak blocks
  - There are no published hourly prices publicly available in the Northwest
- Forward Price - The price at which we could transact today for delivery in the future
- Transactions
  - Forwards, options, swaps, exchanges, etc
  - Variable and Fixed quantity contracts

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Factors that Influence Prices

Generation (Production)

- Availability of water
  - Amount of precipitation
  - Rate at which snow-pack melts
  - Hydro flexibility is decreasing "run of the river"
  - Seasonality of Hydro (Spring Runoffs)
- Fuel price and availability
  - Primarily natural gas
- Plant availability/performance

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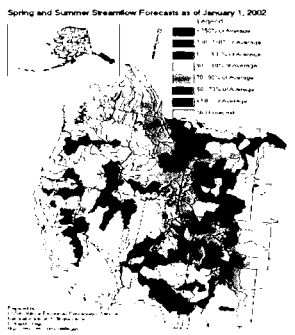
Factors that Influence Prices



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Factors that Influence Prices

Consumption

- Load shape
  - Constant (flat) demand is cheaper to serve
  - Variable (swing) demand is more difficult to serve
    - On Peak swing is more expensive
    - Off Peak swing is less expensive
- Weather and Weather forecasts
- Load growth
- Northwest – Winter Peaking Loads
- Southwest – Summer Peaking Loads
- California – Has both impacts

Factors that Influence Prices

Factors that Influence Prices

Supplier Profile

- Credit requirements
- Risk management policy
  - Each Supplier has a unique risk profile
  - Willingness to sell forward (hedge) to ensure revenues

Consumer Risk Profile:

- Risk appetite - desire for fixed price or floating price
- Credit Capacity
- Term of Commitment

What Lies Over the Horizon

Structure of tomorrow s power market is in development
- How will it look?
- How well will it function?
- Will power market restructuring achieve the intended societal benefits?

More Choices for Consumers

Consumers must become more educated

Purchasing power intelligently will require continuous market tracking as well as appropriate risk management policies