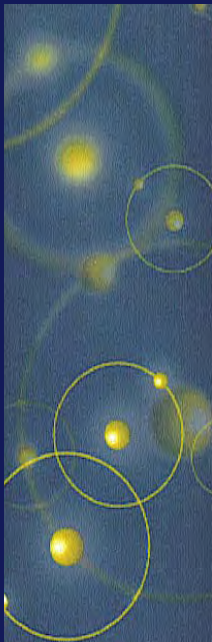




energy strategies

INTERMOUNTAIN CHP SUMMIT



A Look at Transmission Plans in the West and the Region and how they Might Affect CHP

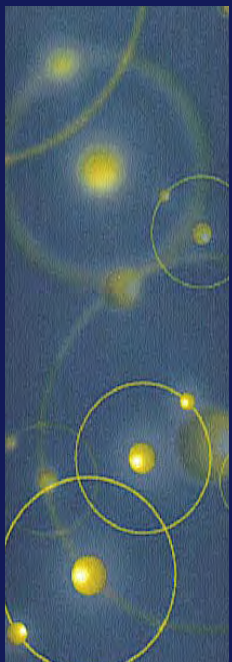
By

Neal Townsend

May 2006

Power Through Ideas

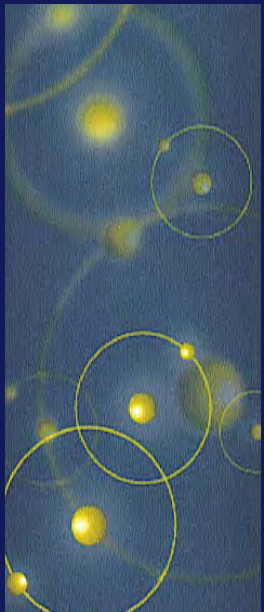
www.energystrat.com



- Overview of Energy Strategies
- Overview of WECC
- Transmission Expansion in the West
- Transmission Interconnection

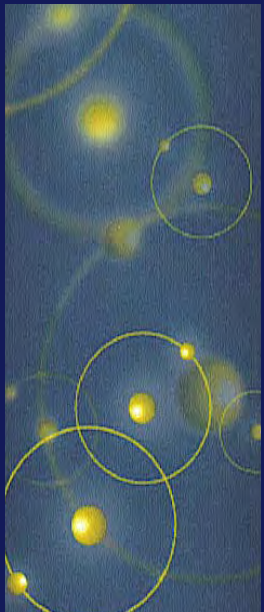


- Founded in 1986
- Offices
 - Salt Lake City
 - Phoenix
- Professional staff of 17+
- Western Focus with National Presence
- Energy Facilities Investment Analyses
- Expert testimony in electric and gas regulatory proceedings



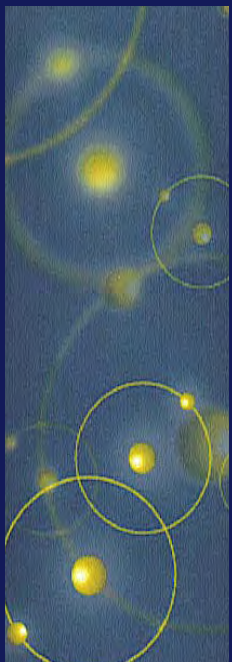
Overview of Western Energy Coordinating Council (WECC)

- 170 + members
- Members include utilities, independent power producers, consumers and regulators.
- WECC has existing since the early 1970's
- Headquarters are in SLC
- WECC activities typically address the High Voltage transmission system - > 138kV
- Some WECC standards impact CHP project interconnect issues



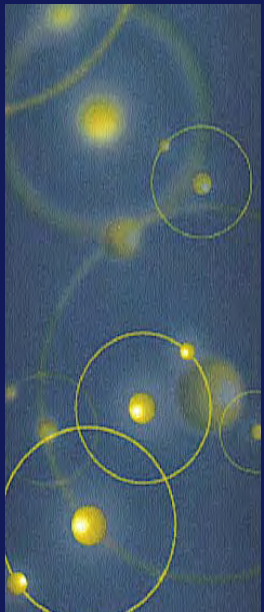
Key WECC Functions

- Electric Reliability - WECC coordinates, sets and maintains electric reliability standards in the west. WECC will implement mandatory reliability standards that result from The Energy Policy Act
- Determines and sets operating standards for the western interconnection
- Conducts transmission system impact studies for the purpose of maintaining and improving electrical reliability
- Funds and oversees three major reliability centers whose job is to work together to "keep the lights on "
- Provides transmission expansion services to members
- Works with members on solving commercial issues that impact system reliability

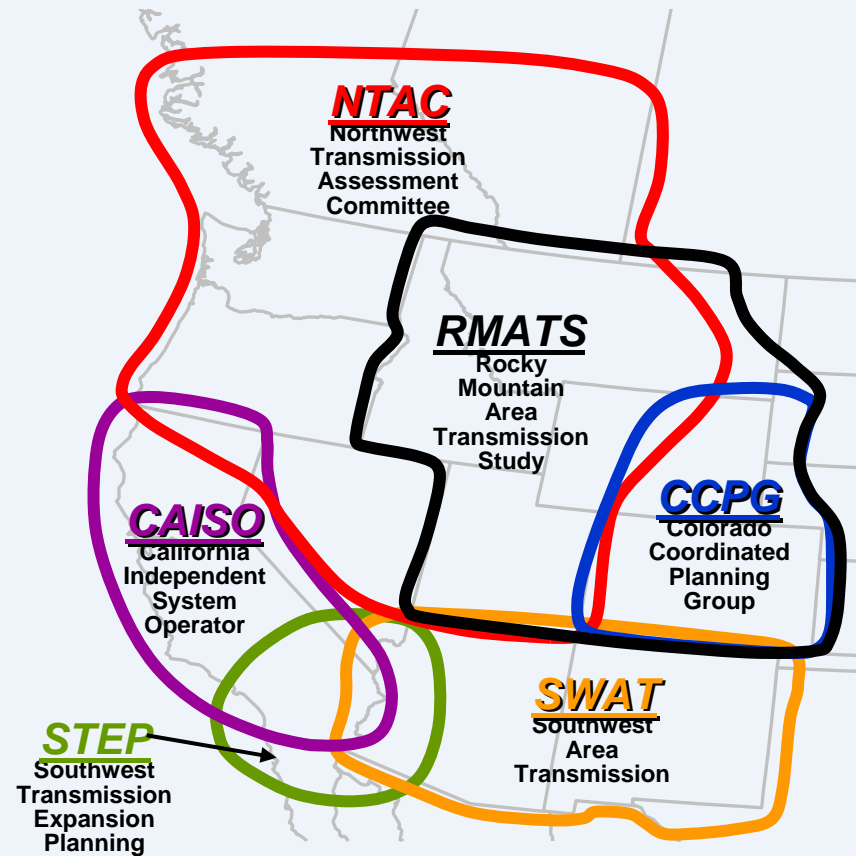


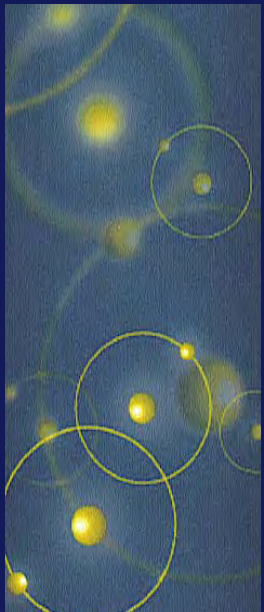
WECC Standards & Policies that may Impact CHP Projects Include

- Utility reserve margin requirements
- Operating and contingency reserve requirements
- Technical interconnect standards, metering requirements and reactive power standards
- Emergency dispatch, re-dispatch issues
- Planning reserve issues



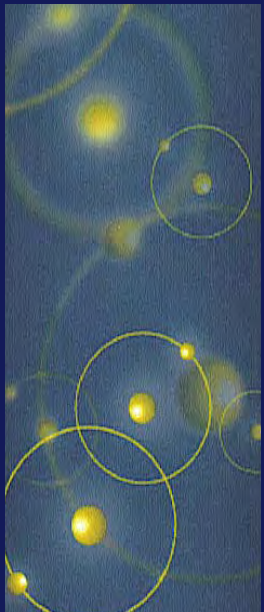
WECC Sub-Regional Planning Groups





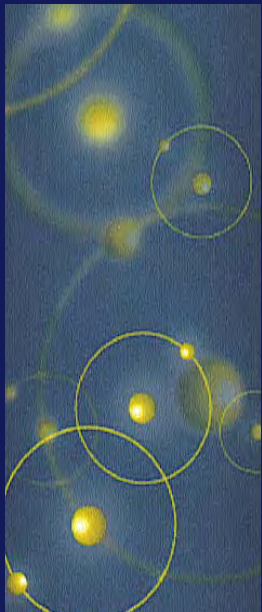
Rocky Mountain Area Transmission Study (RMATS)

- Formed by Gov. Freudenthal (Wyo.) & Gov. Leavitt (Utah)
- Initiated in August 2003
- Rocky Mountain region focus
- Power industry reluctant to invest in transmission
- Results showed several Wyoming transmission path upgrade opportunities



TOT 3 Project

- SE Wyoming to NE Colorado route
- MOU between WAPA/WIA/Trans-Elect to study and develop project
- 500 MW line/345 kV/\$318 Million
- Solicitation for statement of interest issued Nov. 2005

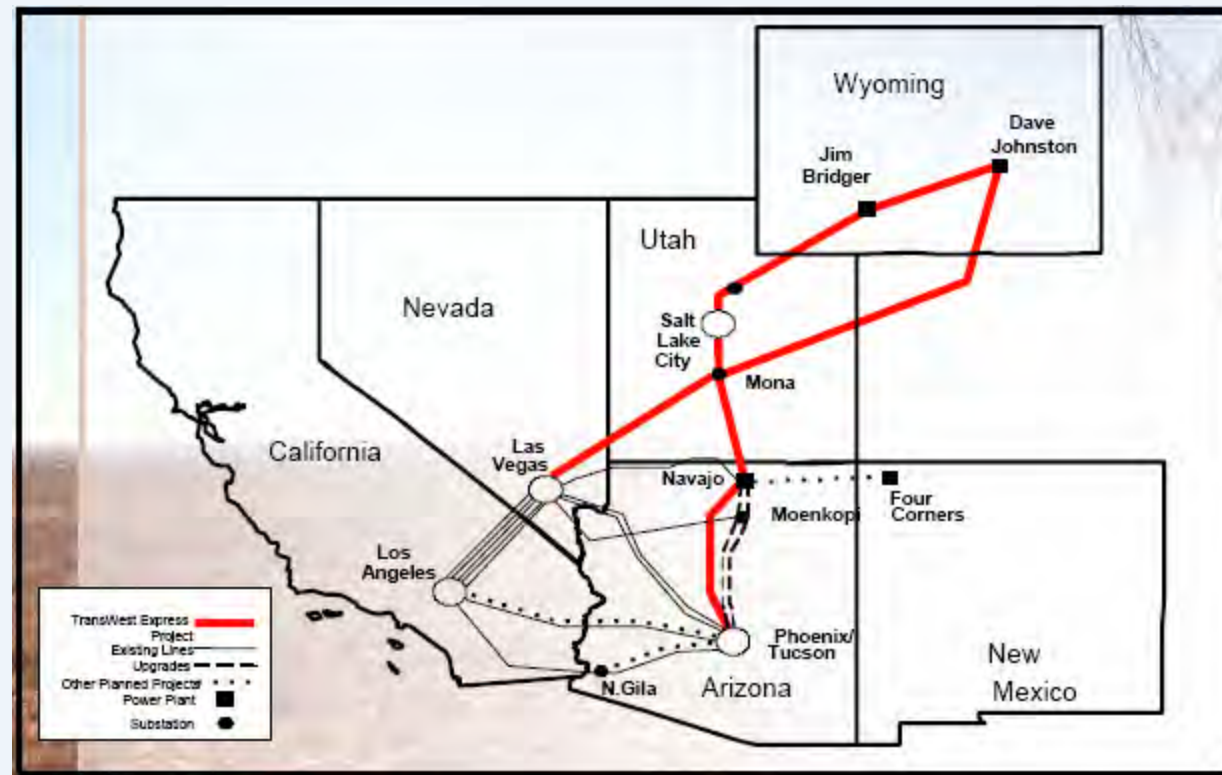
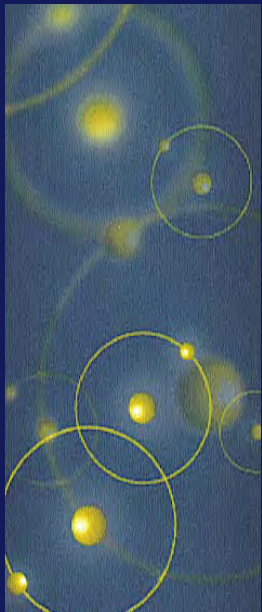


TransWest Project

- Wyoming to Arizona route
- Cost range \$2 billion - \$5 billion
- Two 500 kV transmission lines
- Currently in feasibility study phase
- Plans predict TransWest will be in service by 2013
- May provide utilities in AZ, NV, NM, CA, CO and UT access to additional resources to meet load growth
- Committed to coordinating with Frontier Line Project

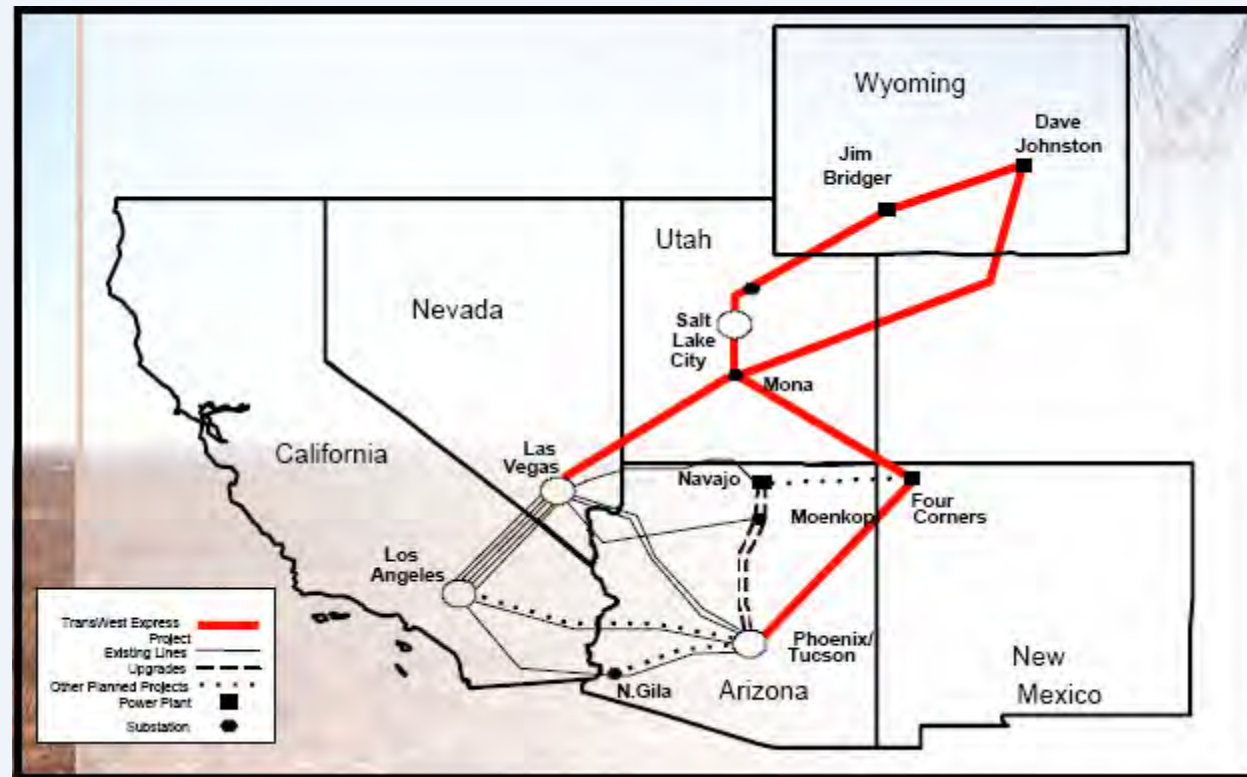
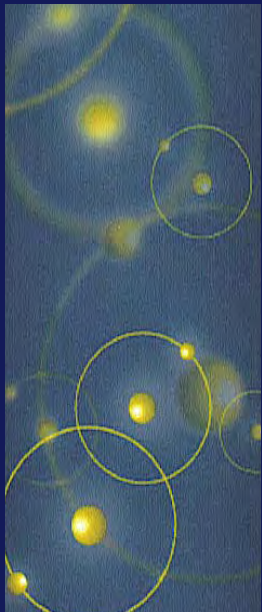


TransWest Transmission Alternative A



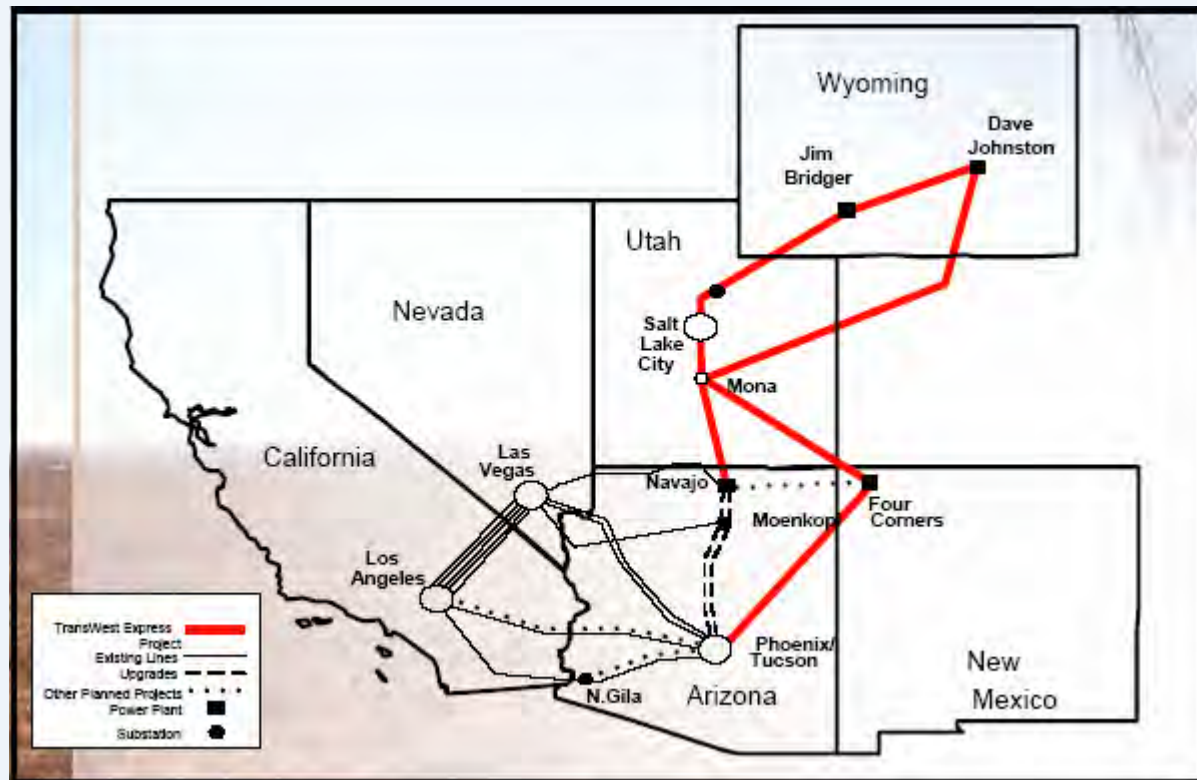


TransWest Transmission Alternative B



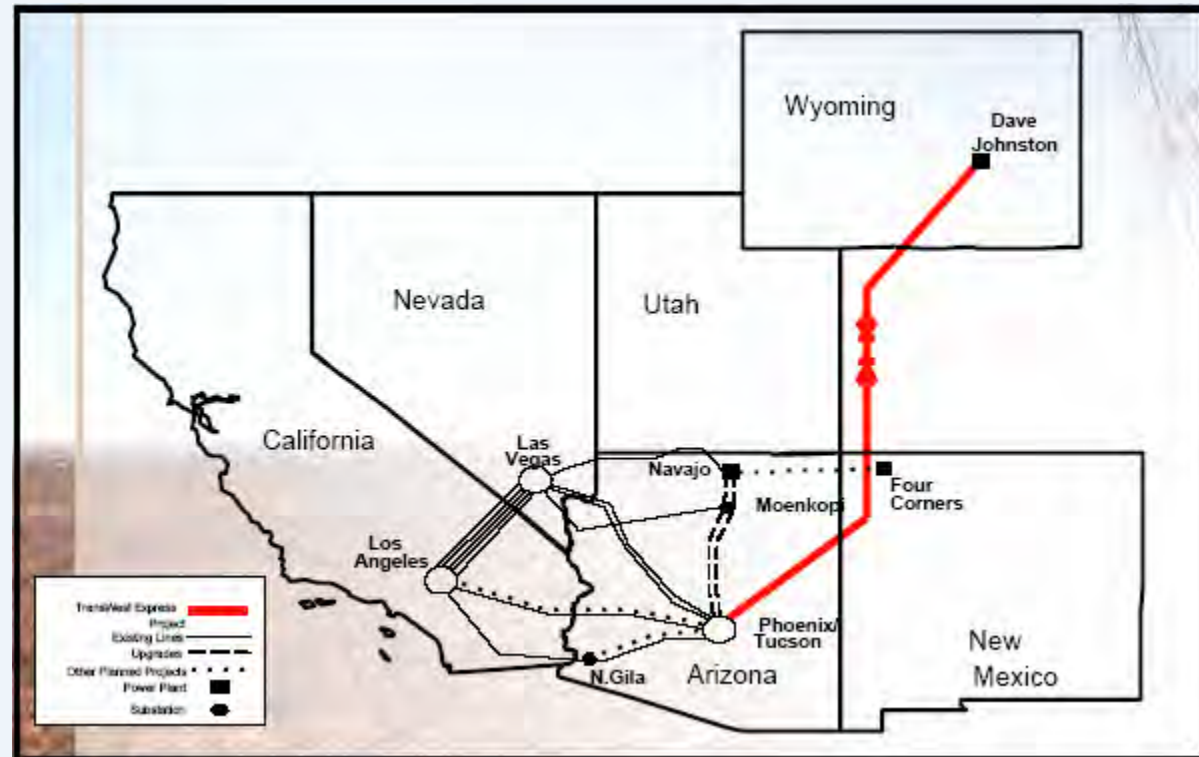
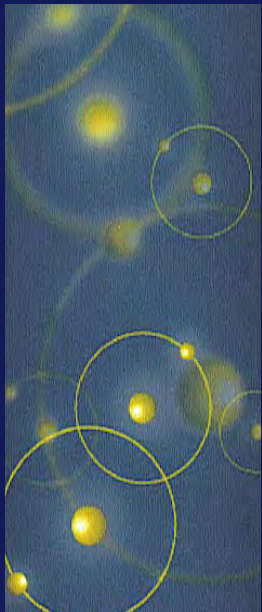


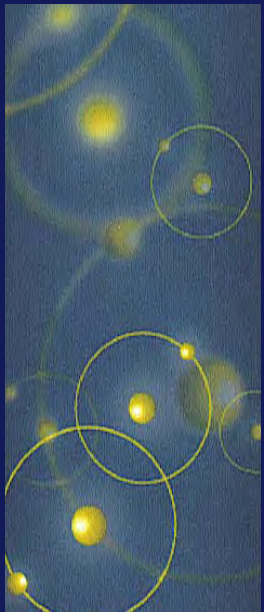
TransWest Transmission Alternative C





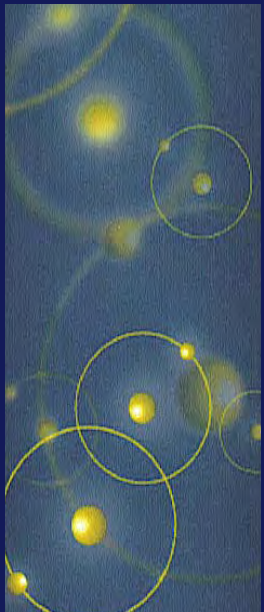
TransWest Transmission Alternative D





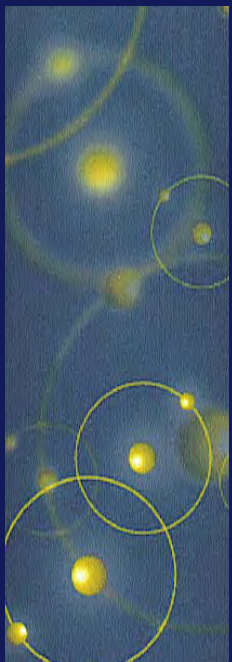
Northern Lights Inland Project

- Wyoming/Montana to Southwest U.S. route
- Cost range \$1+ billion
- Part of two leg plan to move power out of Alberta Canada
- 3,000 MW capacity, DC line
- Plans predict on-line date 2011

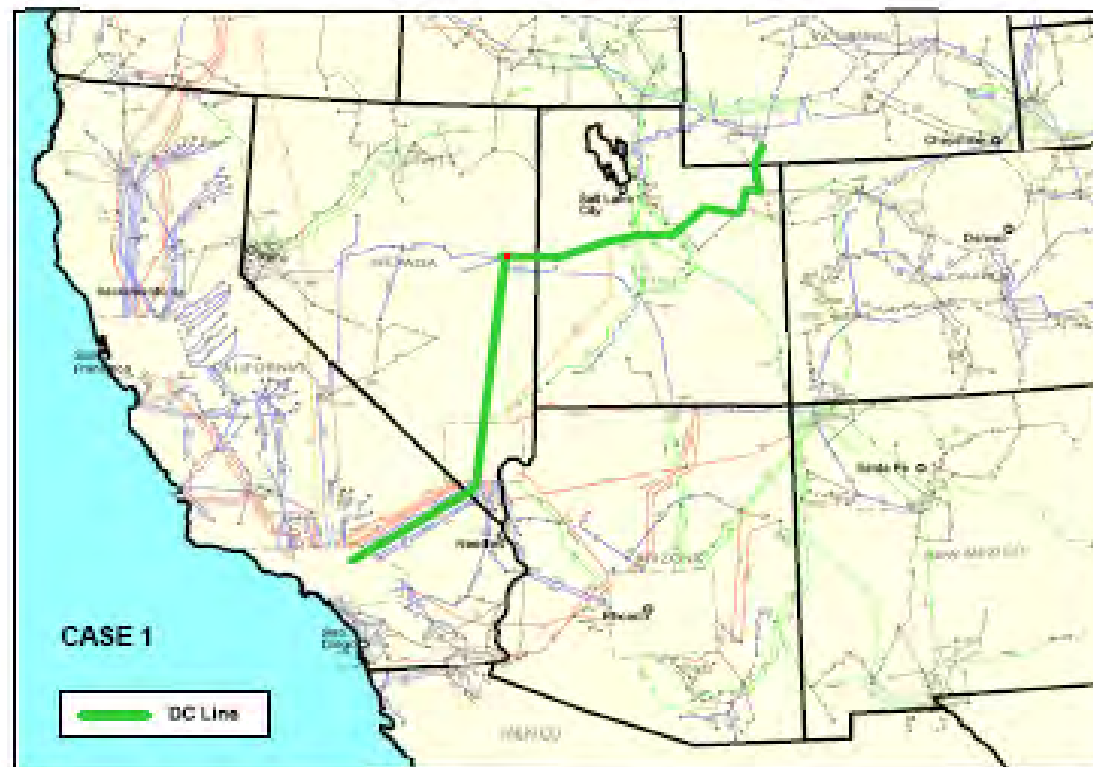


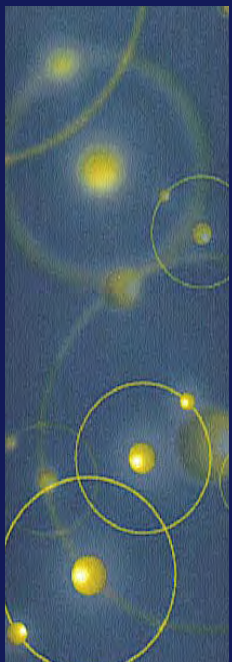
Frontier Line Project

- Announced by Governors of California, Nevada, Utah, and Wyoming in April 2005
- Wyoming to California route (1,300 miles)
- \$3.5 - \$5.0B in Trans. Assets/\$10 - \$15B in general assets
- Facilitates development of renewables (wind) and mine mouth coal plants
- Phase I Feasibility Study initiated

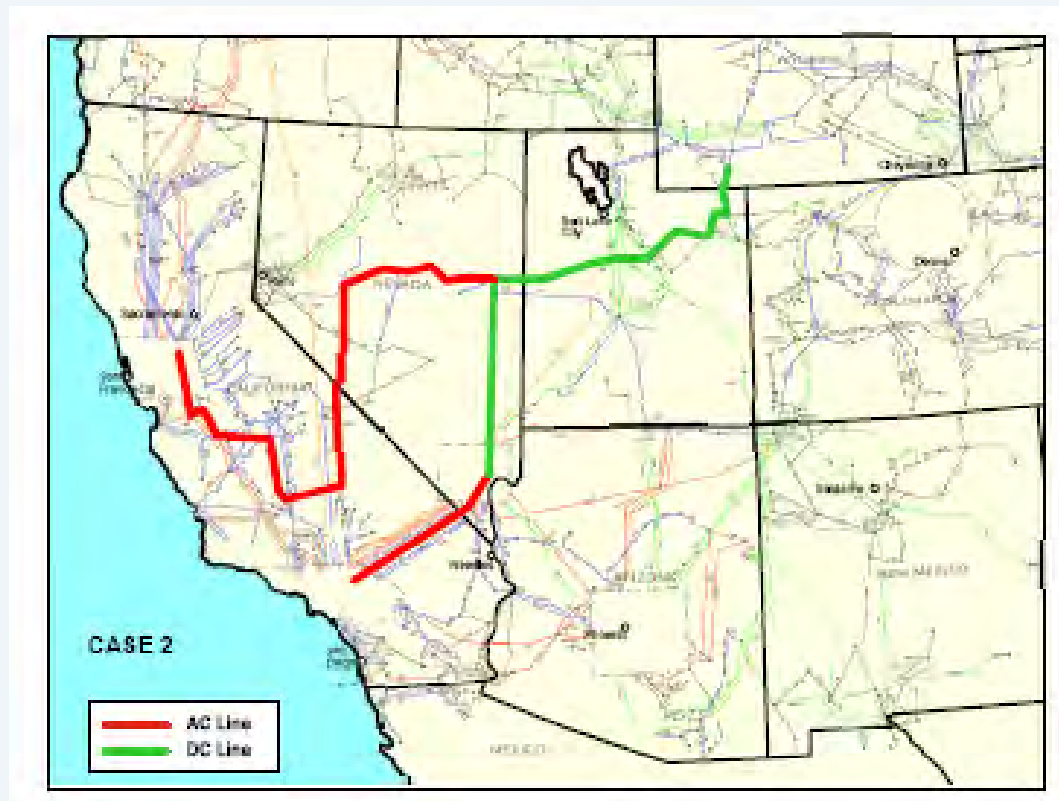


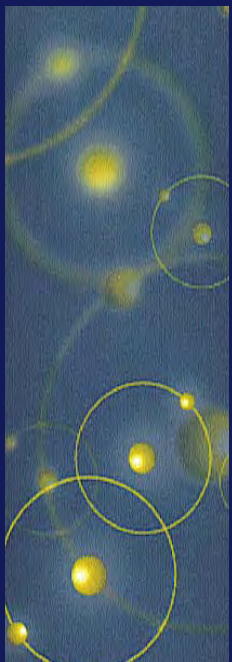
Frontier Line Path 1





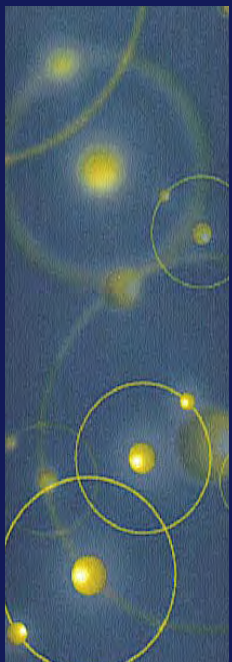
Frontier Line Path 2





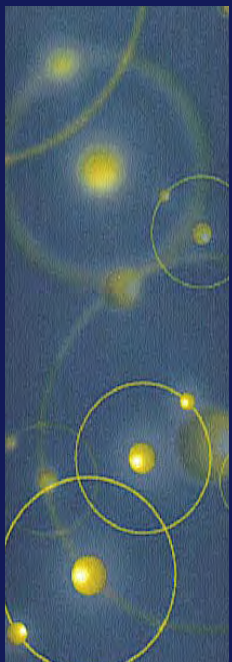
Transmission Interconnection

- FERC required transmission providers to develop interconnection procedures for large (>20 MW) and small (<20 MW) generating plants
- Procedures detail fees, studies, and schedules for addressing interconnection requests on non-discriminatory basis
- Procedures included in each utility's Open Access Transmission Tariff (OATT)
- Rules nice to have but . . . Disputes resolution (either by FERC or state commission) can be costly – beyond the financial resources for many CHP projects



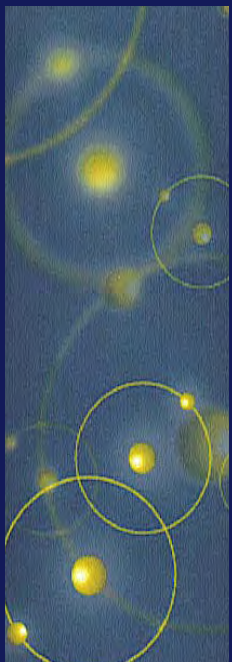
Tesoro Cogeneration Project – A Case Study

- 22 MWs – 2 Solar Taurus Turbines began operation in Fall of 2004
- Replaced 1940s vintage boilers
- Refinery located in dense, urban Salt Lake City, the utility's main Utah load center
- 85%+ efficiency, 97% availability, “net” reduction in Salt Lake Valley emissions (toughest air quality restrictions in Utah)
- Buy all-sell all agreement with the utility
- Engineering & Construction – 24 months
- Air quality permit time – 12 months



Tesoro Cogeneration Project – A Case Study

- Generation Interconnect System Impact Study (per OATT) – 3 submitted – took 6 months to acknowledge
- Generation Interconnect System Impact Study – 4 months to complete (6 pages long)
- Interconnection Agreements - 3 required by utility – 18 months to complete
- Engineering Services Agreement to pay utility for engineering services – 15 pages long
- Interconnect Construction Agreement (CHP required to pay for interconnection costs) – 45 pages long
- Interconnect O&M agreements – 24 pages long
- Total transmission interconnect time – 26 months



Summary & Conclusions