

PLENARY SESSION: 11:00 AM-NOON

The Second Energy Boom

11:00 a.m.—12:00 p.m.

Thursday, March 9, 2006

Sturm Hall, Davis Auditorium

The Rocky Mountain West is experiencing another energy boom and the stakes are higher than ever. What are the social, economic, and environmental implications? What have we learned from previous booms and busts? What are states and local governments doing to address the positive and negative impacts?

Moderator: **Kathy Kanda**

Associate
McGeady Sisneros
Denver, Colorado

Panelists: **Jim Martin**

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Rich Halvey

Project Manager
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Western Resource Advocates (WRA)

- **Regional non-profit working to protect the environment of the Interior West**
- **Energy and Lands Programs**
 - Promote clean energy development in the region
 - Interdisciplinary staff – economists, engineers, lawyers
 - Work primarily in state & regional forums

www.westernresourceadvocates.org



TWO BIG ISSUES GOING FORWARD

- New electrical energy capacity
- New natural gas development on public and split estate lands
- Both have the potential to change the landscape
- State and local governments have a lot to say about how these developments proceed



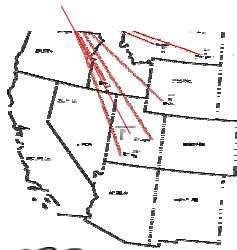
Coal's Resurgence in the Interior West

- **31 new coal plants representing over 18,500 MW have been proposed in the region**
- **16 plants (8,200 MW) in the permitting process**
- **Of the 16 plants in permitting**
 - 9 sub-critical (5600 MW)
 - 5 super-critical (2250 MW)
 - 2 CFB (350 MW)
 - **0 IGCC**



Proposed New Coal Plants in Interior West Targeting Pacific Northwest Electricity Markets

- **An estimated 8 coal plants totaling over 8,000 MW proposed potentially to serve Pacific Northwest Markets**



Environmental Implications

- If built, currently proposed coal plants will run through 2060, when our children's children are coming of age
- **The 16 proposed new coal plants (8200 MW) currently in the permitting process would emit over 66 million tons of CO2 per year (59.9 MMtCO2e)**
 - Equivalent to 2.5 times the CO2 emissions from Oregon's electricity sector in year 2000 (24 MMtCO2)
 - Equivalent to 88% of Oregon's year 2000 emissions of all greenhouse gases from all sources (67.7 MMtCO2e)
- **The plants would emit significant amounts of other harmful pollutants contributing to haze, ozone, nitrogen deposition and other air quality problems in the Interior West.**
 - 31,000 tons of SO2 per year
 - 22,000 tons of NOX per year
 - 9,000 tons of PM
 - 1.25 tons of mercury



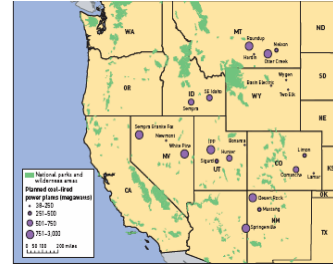


Coal to California

- Coal plants in the West supply 20% of California's electrical energy
 - SO2 emissions from those coal plants exceed all SO2 emissions from all sources inside CA
 - CA's coal plants emit 67 million TONS of carbon dioxide each year. Equivalent to emissions from 11 million cars
- Four Corners and San Juan Plants in NM; Mohave and Reid Gardner in NV; Navajo in AZ; IPP in UT.



More?



Balanced Energy Plan

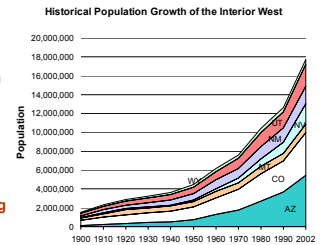
Study Objectives:

- Develop aggressive but feasible cleaner, diversified energy plan for the Interior West – AZ, CO, NM, NV, UT & WY
- Compare costs, benefits & transmission implications of the Plan to a business-as-usual scenario relying primarily on fossil fuels
- Relative to Business-as-Usual, Balanced Plan includes:
 - Significantly increased reliance on renewable energy, energy efficiency and distributed combined-heat & power resources
 - Retirement of some older, less efficient, more polluting fossil resources now on the system



Background

- Interior West is a rapidly growing region
- Population is concentrated in urban areas
- Available electricity resources not always near where people live
- How do we best meet growing electricity demands?



Historically, Interior West has relied on:

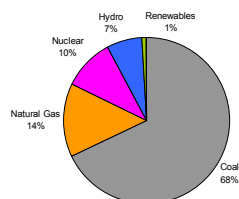
- Large power plants remote from load centers
- Long transmission lines to deliver electricity
- Fossil fuels, especially coal
- More recently natural gas plants closer to load centers

Historic benefits:

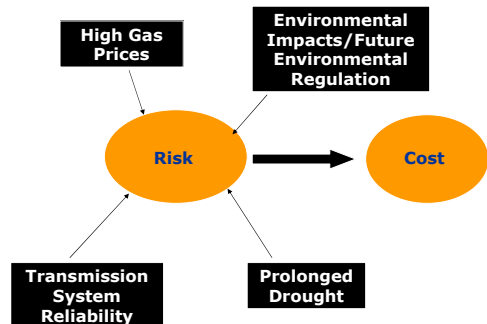
- Reliable electricity supply
- Stable, generally low electricity rates

But

2002 Interior West Electric Mix



Current system subject to growing risks





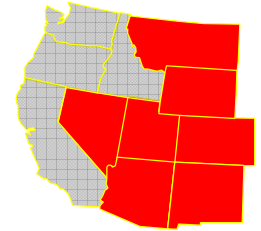
Balanced Energy Plan seeks to:

- Reduce and manage risks
- Lower the cost of electric energy services
- Reduce environmental impacts of power production
- Ensure transmission and generation reliability



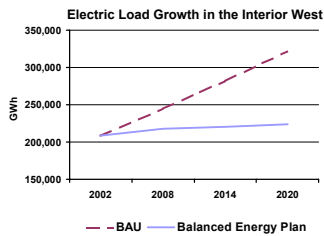
Geographic Scope

- Focus is seven state Interior West region
- PROSYM modeling includes CA and PNW

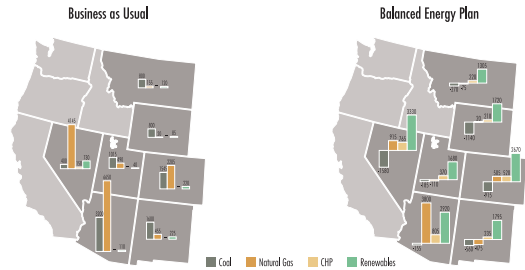


Role of Energy Efficiency

- The Balanced Energy Plan employs large amounts of cost effective energy efficiency consistent with the Southwest Energy Efficiency Project (SWEEP) study: *The New Mother Lode*.
- Efficiency reduces electricity consumption in the region by 30 percent, relative to BAU



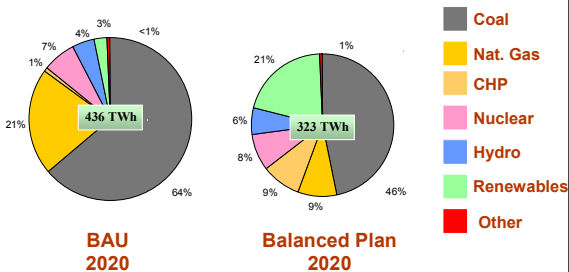
Capacity Additions



Note: Figures rounded to nearest 5 MW.



Generation Mix



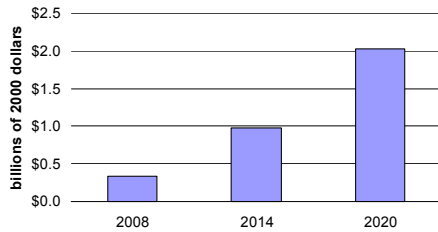
Caveat

- We did not model genuinely clean-coal technologies.
- But Midwestern & Southern utilities are embracing IGCC.
- Significantly reduced emissions of conventional pollutants.
- Uses much less water.
- Can capture and sequester carbon.
- Senator Salazar's amendment paves the way.
- Colo legislation to demonstrate using western coals at high altitude.



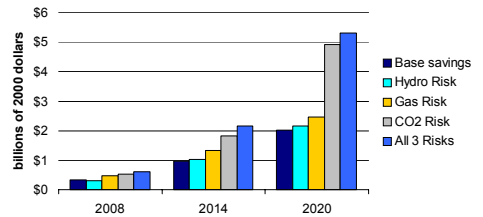
Benefits: Cost Savings

Balanced Energy Plan Savings
Relative to Business as Usual



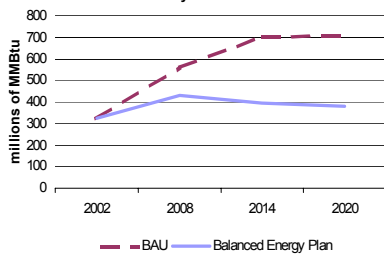
Benefits: Risk Mitigation

Risk Scenarios: Balanced Energy Plan Savings
Relative to BAU

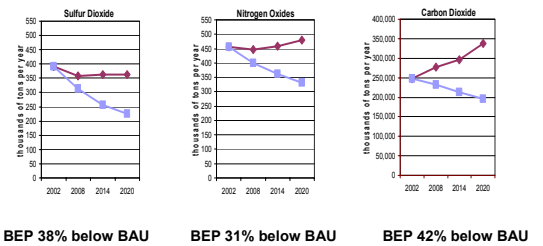


Benefits: Decreased Natural Gas Use

Natural Gas Consumption by the Electric Power
Industry in the Interior West



Benefits: Less Pollution



Reliability

- Analysis ensured that both the BAU and Balanced Energy Plan reliably meet electric demands.
- Both scenarios include adequate generation and transmission resources to meet demand in all parts of the western grid during all hours of the year.
- Balanced Plan paid special attention to effect of intermittent wind resources on system reliability
 - Used PROSYM to model winds intermittent nature and reflect the costs of incorporating intermittent generation into the grid
 - Balanced Plan is mix of energy efficiency, intermittent and other renewable resources and conventional resources with sufficient capacity and availability to meet demand at all times and in all parts of the western grid.



Moving Forward

- Business must lead the way
 - Truly the least-cost alternative
- State and local governments should be involved –
 - Air quality
 - Cost
 - Water resources
- State- and local-level initiatives
 - RES
 - Appropriate building codes
 - Tax policies
 - System benefits charges



Switching subjects

- Steady demand for natural gas, some say increasing demand.
- Level or declining production in most of the U.S.
- Increasing production in Rockies
- But....
 - Protect sensitive places
 - Do it right!



Fig. 2 U.S. Natural Gas Consumption: 1970–2003

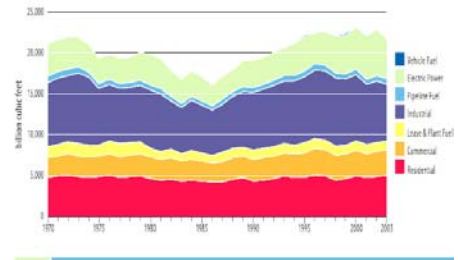


Fig. 3 U.S. Natural Gas Production and Net Imports

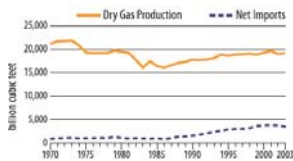
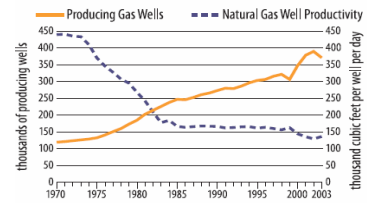
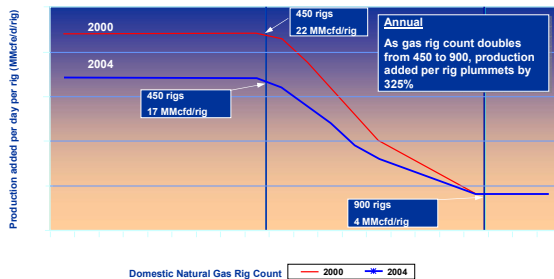


Fig. 4 U.S. Natural Gas Well Productivity



Production Added per Day per Gas Rig, 2000-2004



Source: Bank of America, 2004.



Fig. 5 Gas Consumption Will Increase Slowly

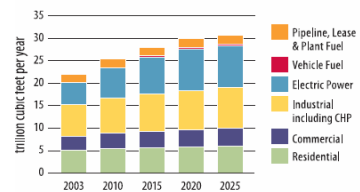


Fig. 6. Forecast of U.S. Gas Supply: Rocky Mountain Gas and LNG Will Increase in Importance

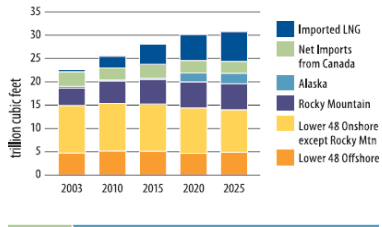
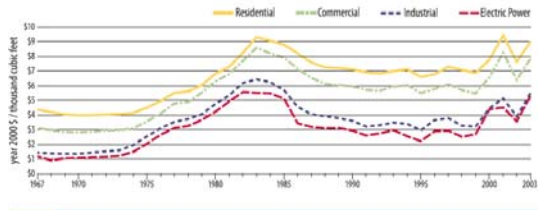
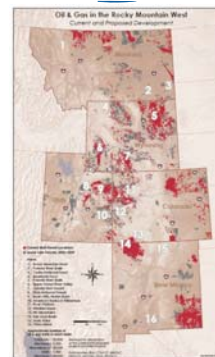


Fig. 7. Natural Gas Prices Are Volatile and Generally Rising (Constant Dollars)



Activity in the Rockies

- **Over 35 million acres** of federal public lands were under lease for oil and gas in 2004.
- However, only 11,671,000 acres under lease were in production.
- In FY 2004, the BLM issued a record number of drilling permits on federal lands– 6,052.
- The industry drilled only 2,702 new wells on those permits.
- **Natural gas production from onshore federal lands has more than doubled since 1992, to an all-time high in 2004.**
 - Between 2003 and 2004, production increased from 2.226 TCF to 3.133 TCF – a 42% increase in one year.



Jonah Basin in WY

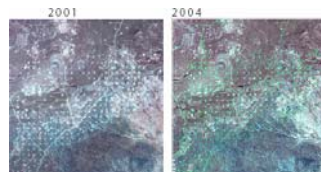
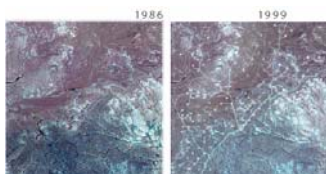




Fig. 8. Summary of Gas Savings Potential

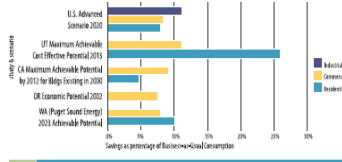
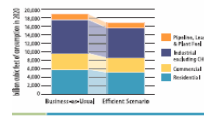
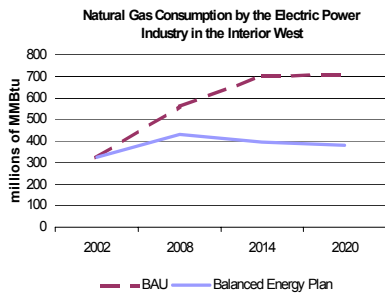


Fig. 9. Residential, Commercial, and Industrial Gas Consumption Could Be Reduced 11% in 2020 with Energy Efficiency



Benefits: Decreased Natural Gas Use



The Only Way Out

- **Efficiency Investments**
 - Reduce gas consumption
 - Save consumers money
 - Lower gas prices
 - Reduce pressure to drill



State and Local Governments

- **Renewable Portfolio Standards**
- **Updated building codes**
- **Tax incentives and tax credits**
- **State-based efficiency standards**
 - System benefit charges to support investments in public buildings like schools, hospitals.