

EMF 20: Natural Gas, Fuel Diversity and North American Energy Markets



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North American Market in Transition

- Burner-tip regulation after 60 years.
- Summer gas use changes storage dynamics and volatility.
- Pipelines constrain gas use in some regions.
- Are continental resources peaking like oil 30 years ago?

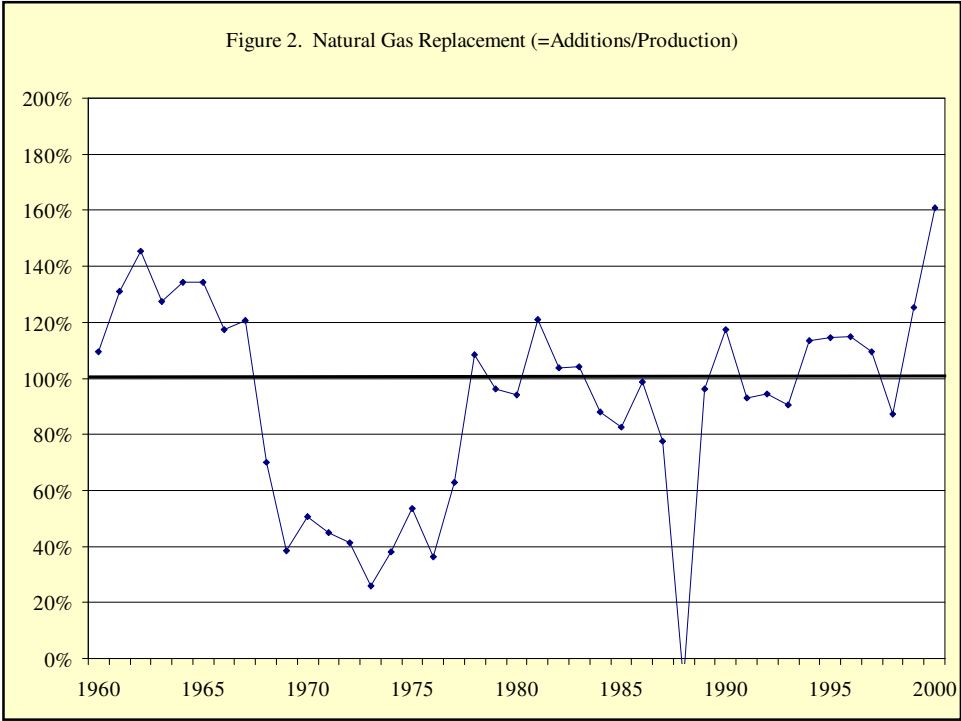
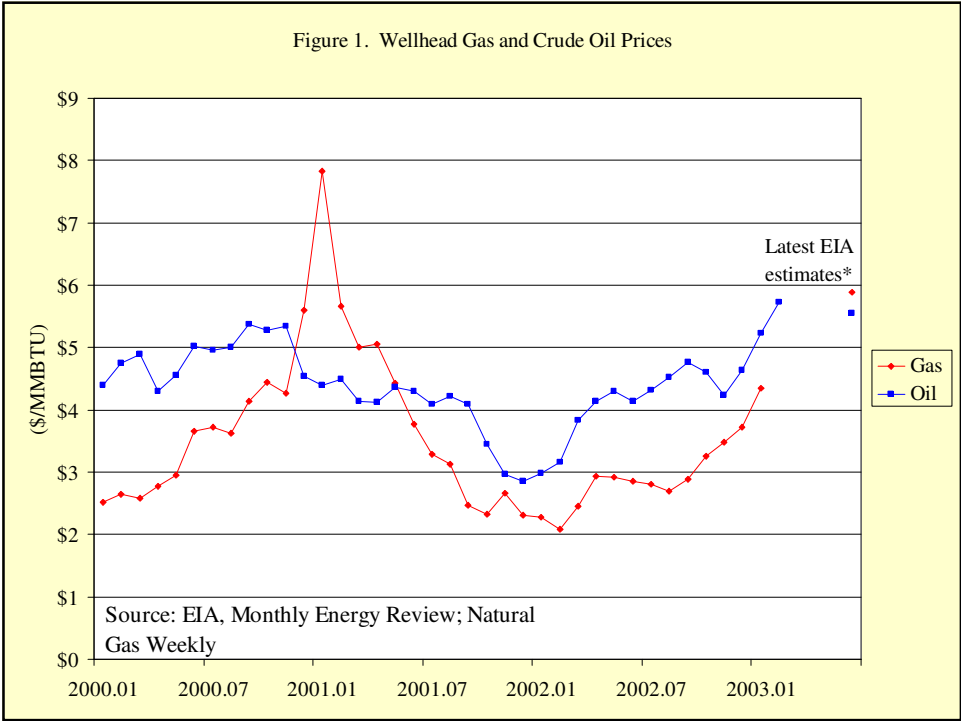


Figure 3. Depleted Resources and Expanded Demand

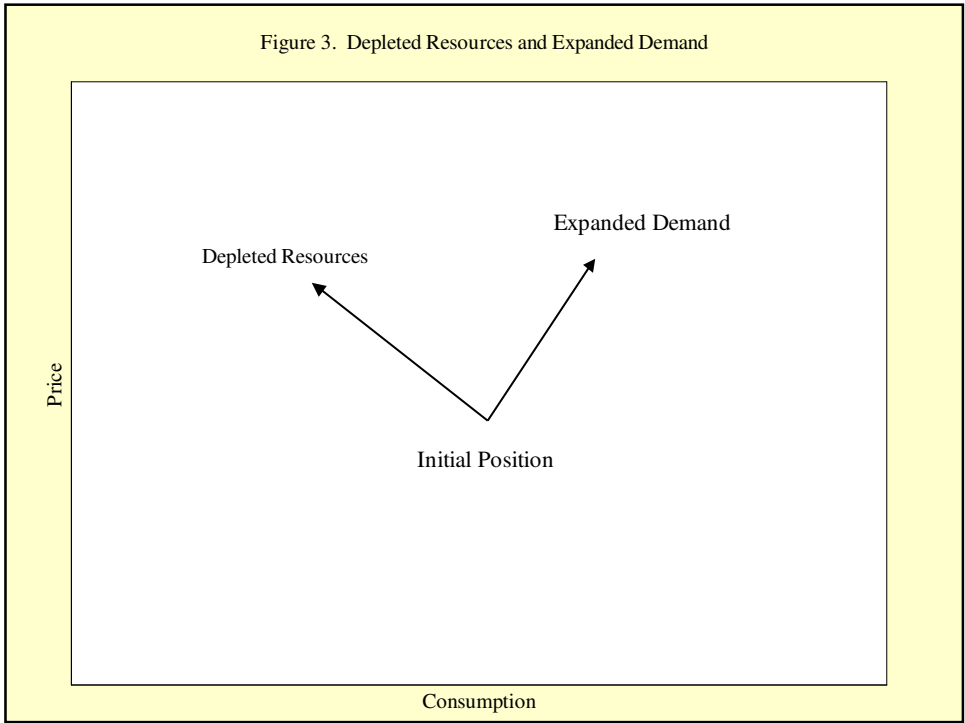


Figure 4. Recent Natural Gas Prices and Consumption

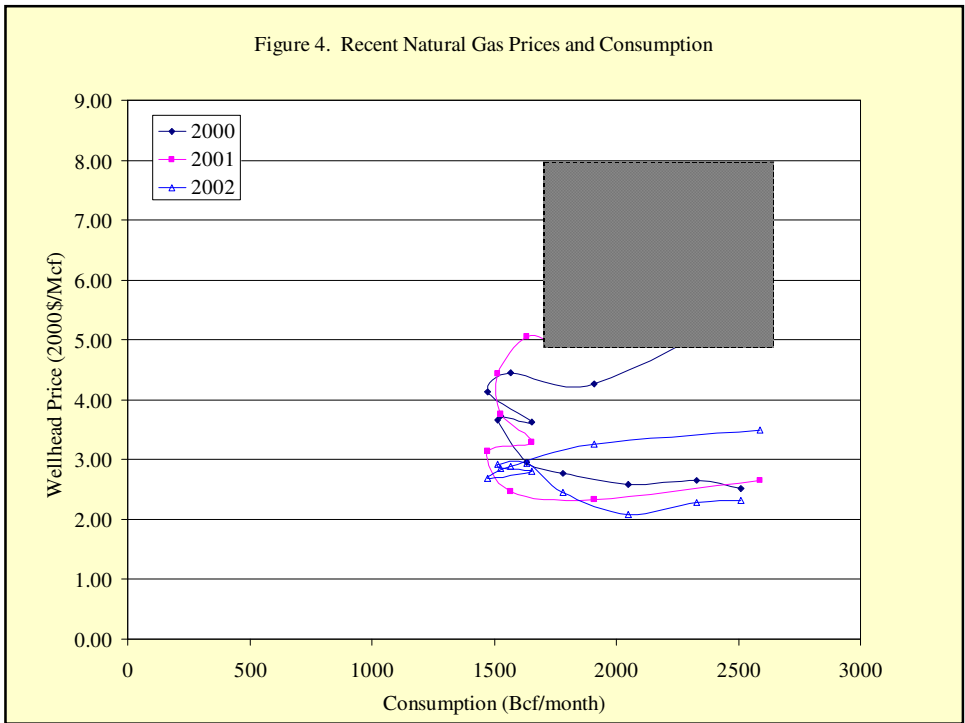
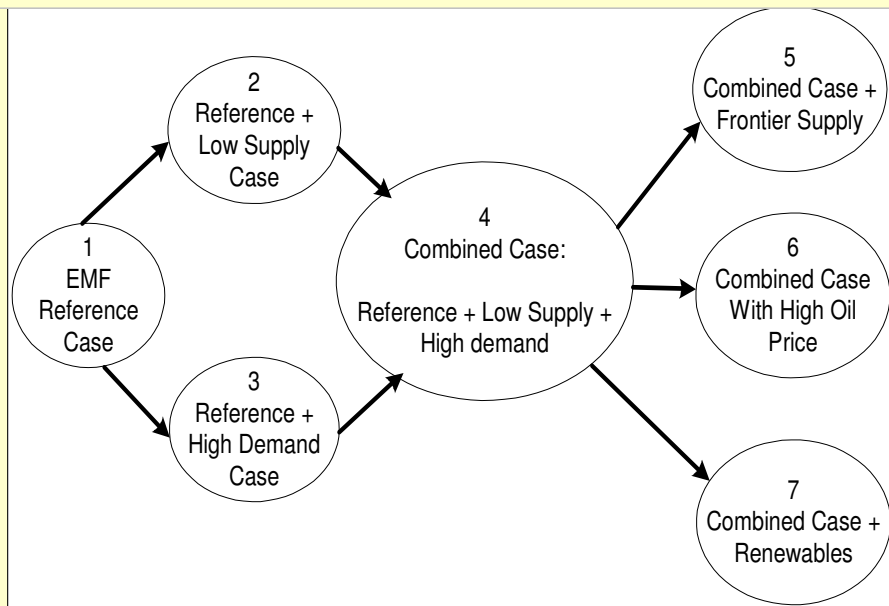


Table 1. Models in EMF Study			
Model Name	Symbol	Proprietor	Energy Markets
U.S. Markal	Markal	U.S. Department of Energy; Brookhaven National Laboratory	All U.S. energy markets
Energy 2020	E2020	Canadian Energy Research Institute	All Canadian and U.S. energy markets
National Energy Modeling System	NEMS	U.S. Energy Information Administration	All U.S. energy markets
Policy Office Electricity Modeling System	POEMS	U.S. Department of Energy; Onlocation, Inc.	U.S. electricity and gas markets
NANGAS/IPM	NANGAS	U.S. Environmental Protection Agency; ICF Consulting	U.S. electricity and gas markets
MarketPoint	MarketPoint	Altos Management Partners	Canadian and U.S. electricity and gas markets
North American Regional Gas	NARG	California Energy Commission	Canadian and U.S. gas markets
Model for US and International Natural Gas Simulations (MUSINGS)	CRA	Charles River Associates	Canadian and U.S. gas markets

Figure 5: EMF Study Scenarios



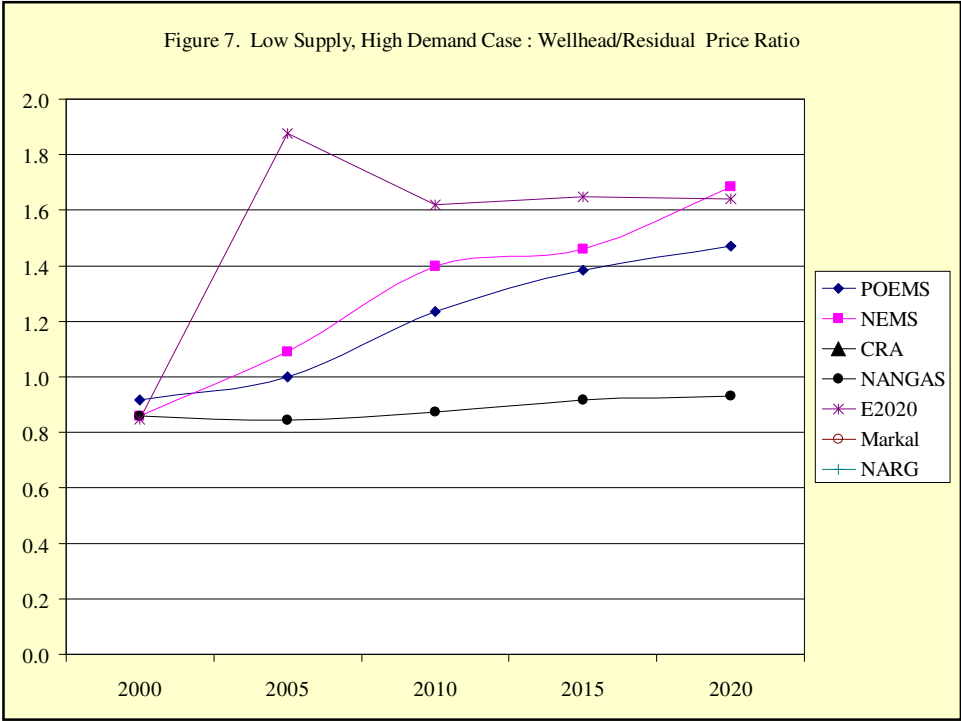
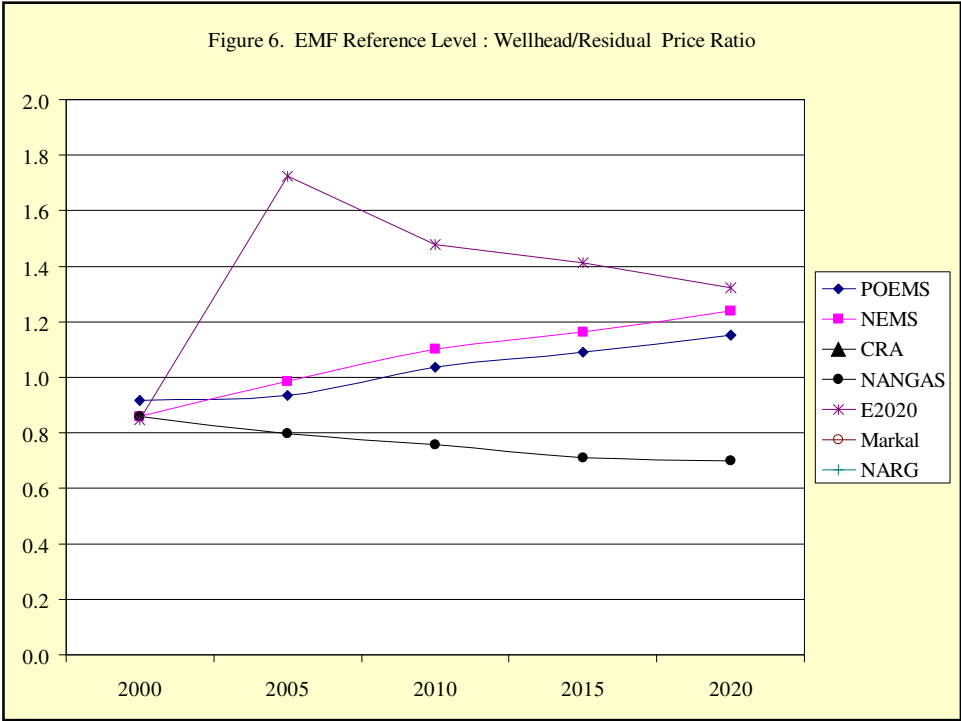


Figure 8. High Oil Case : Wellhead/Residual Price Ratio

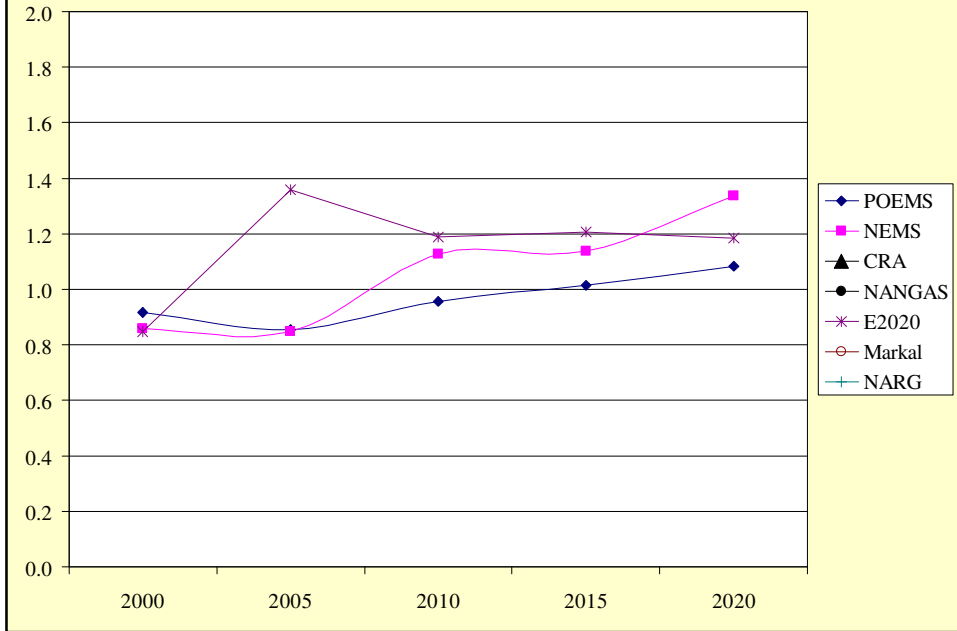


Figure 9. Cumulative Fuel Source for Electricity (%), 2020

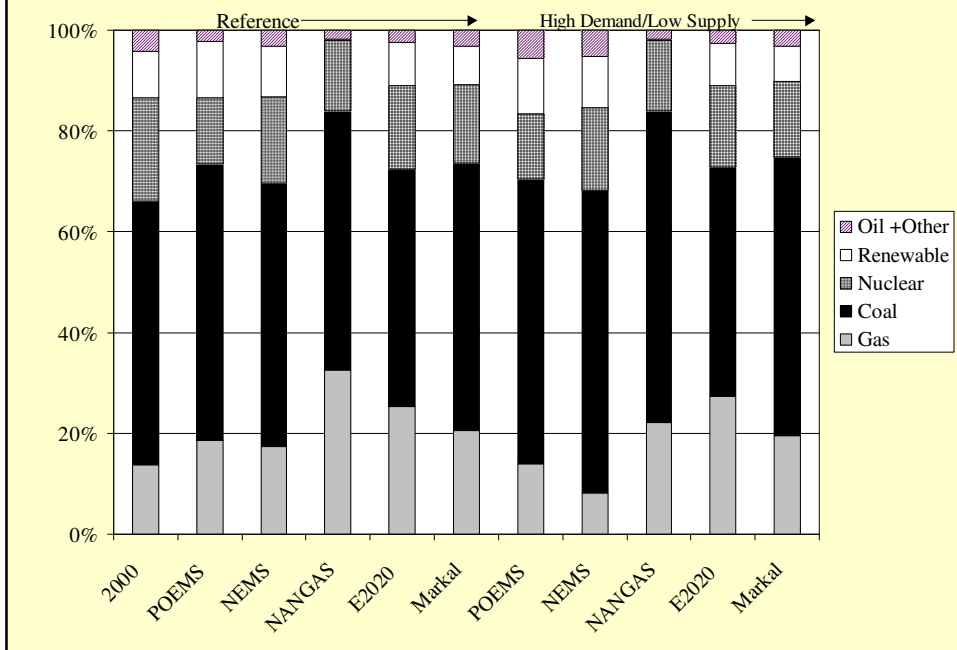


Figure 10. Natural Gas Conditions in Reference Case

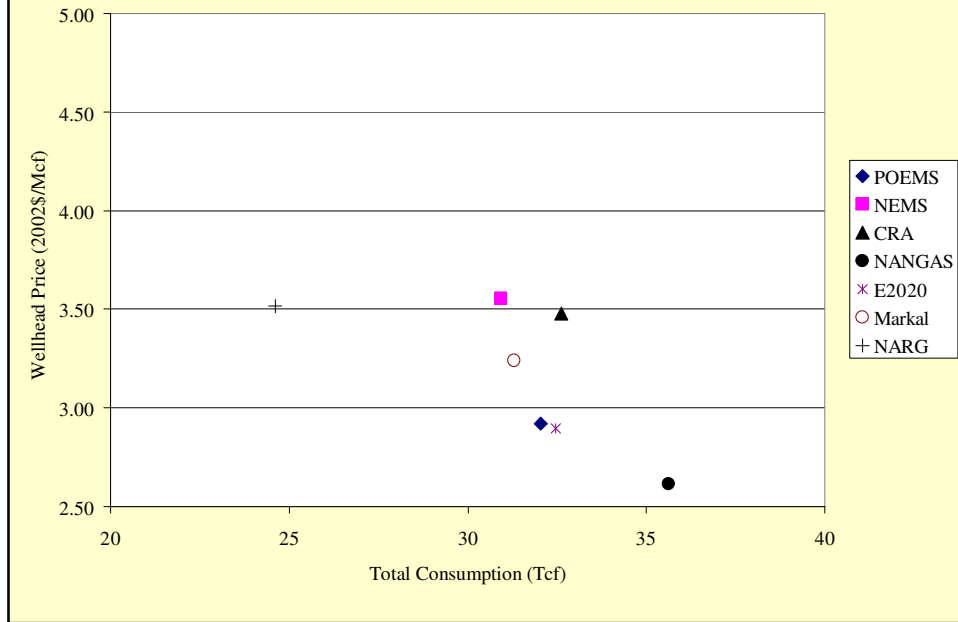
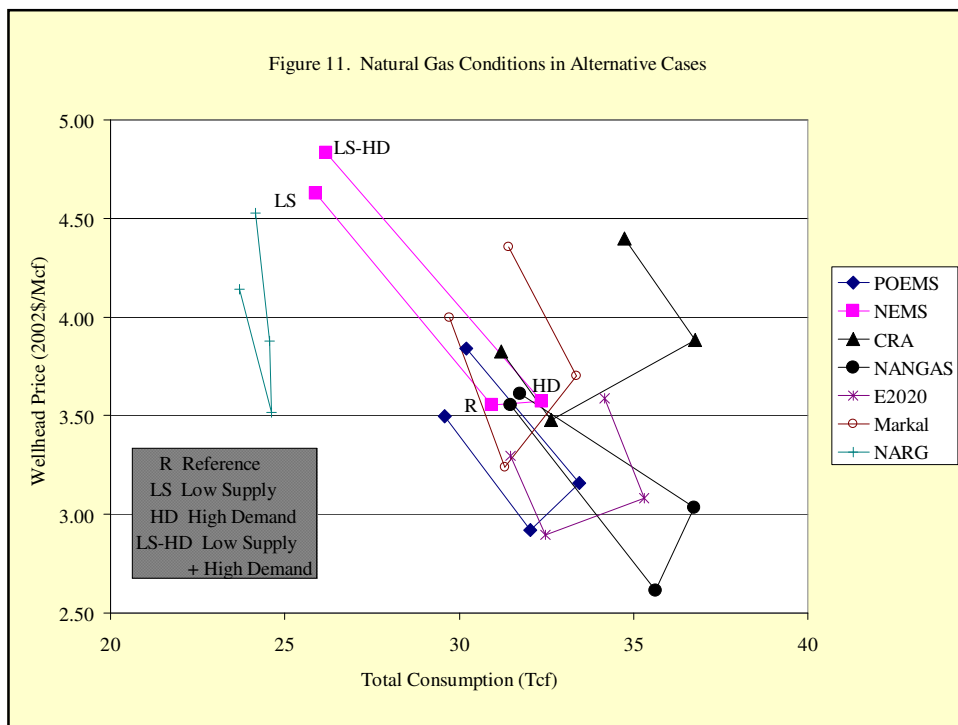
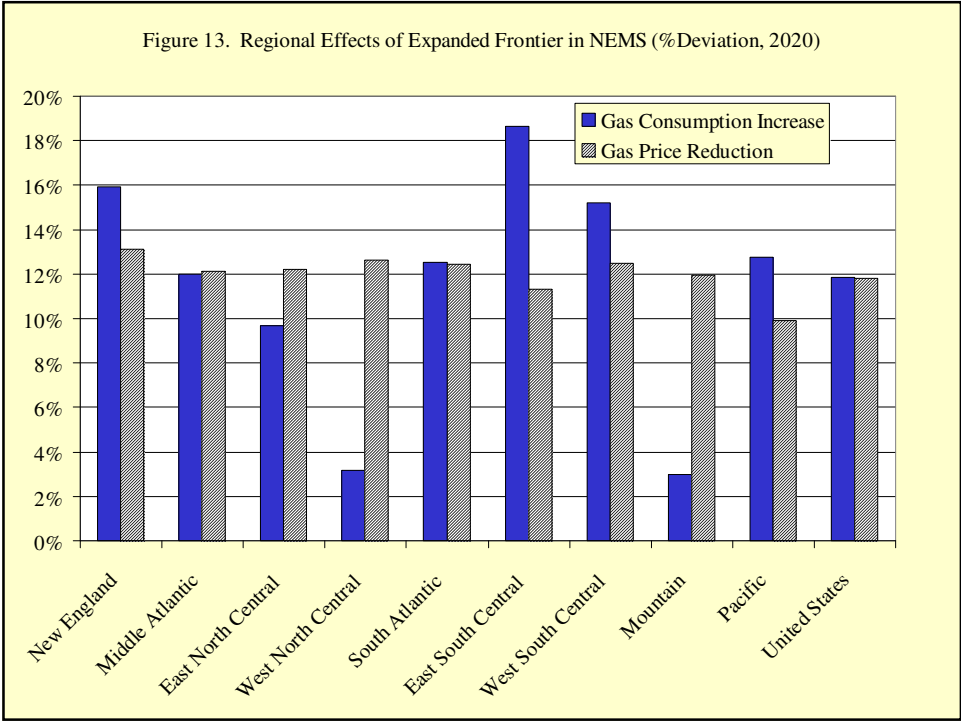
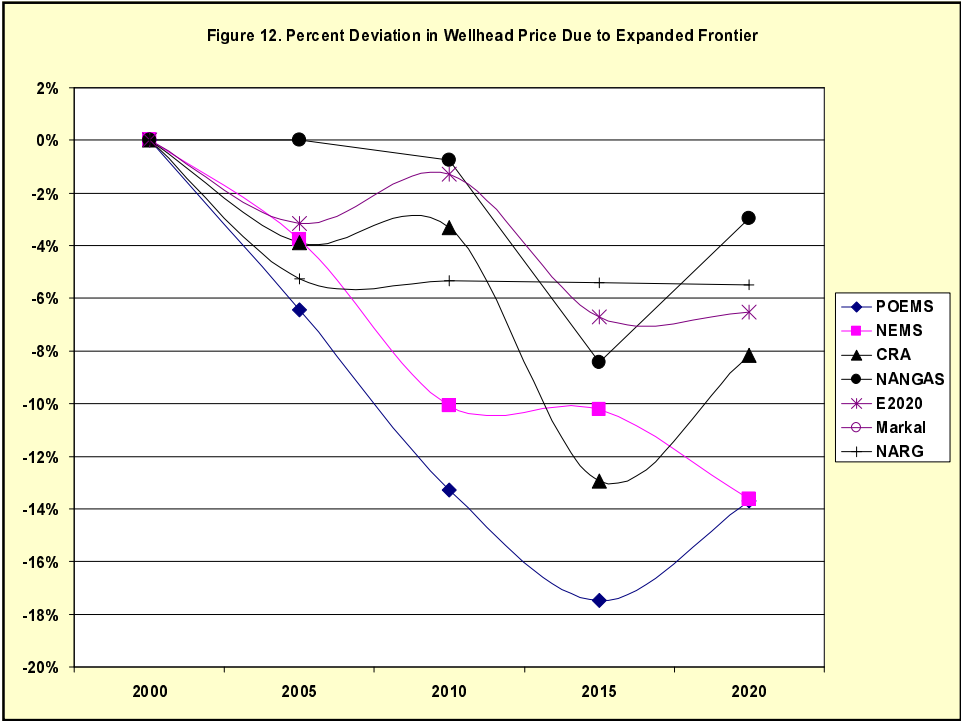
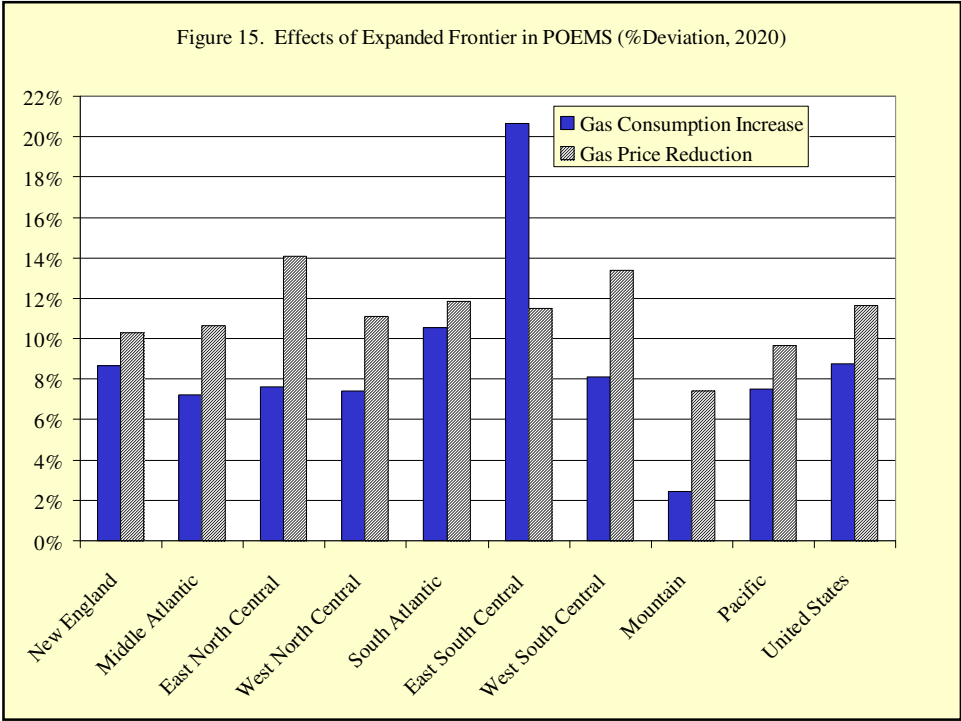
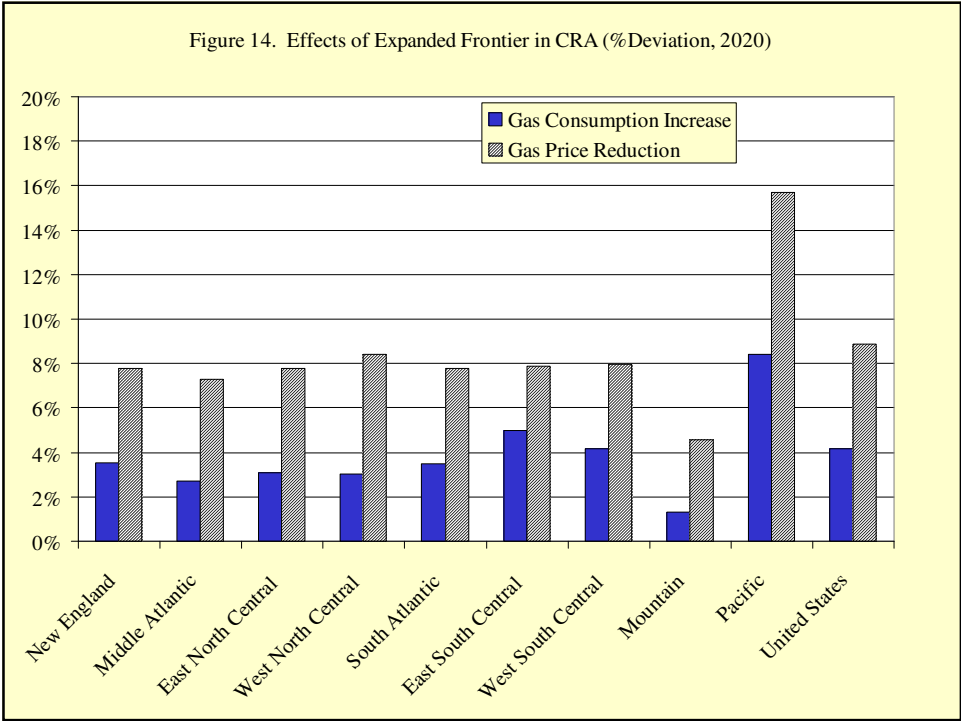


Figure 11. Natural Gas Conditions in Alternative Cases







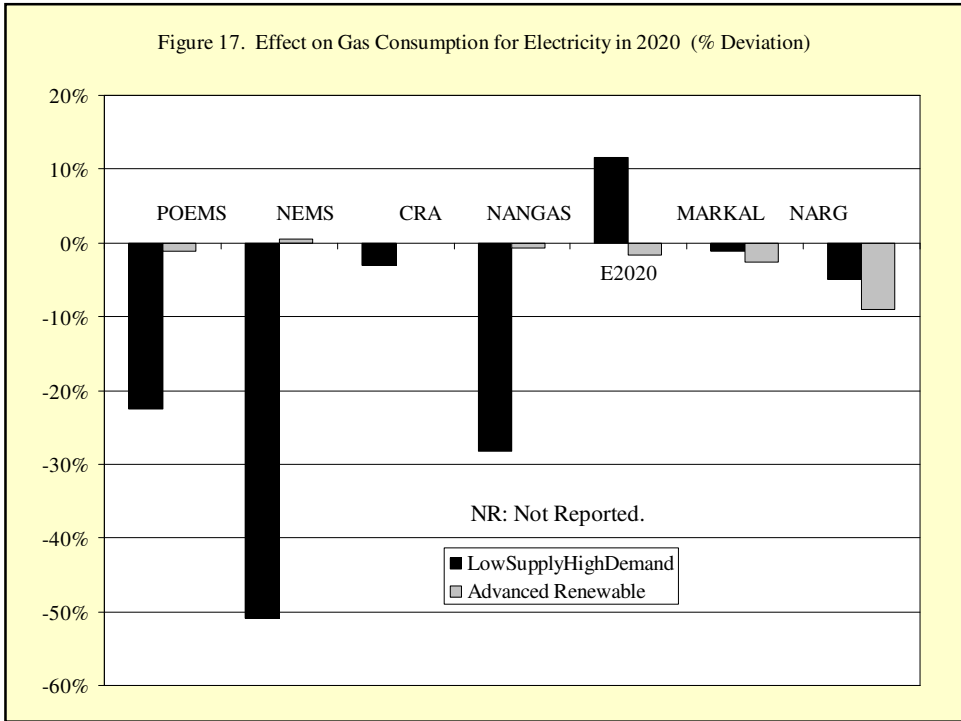
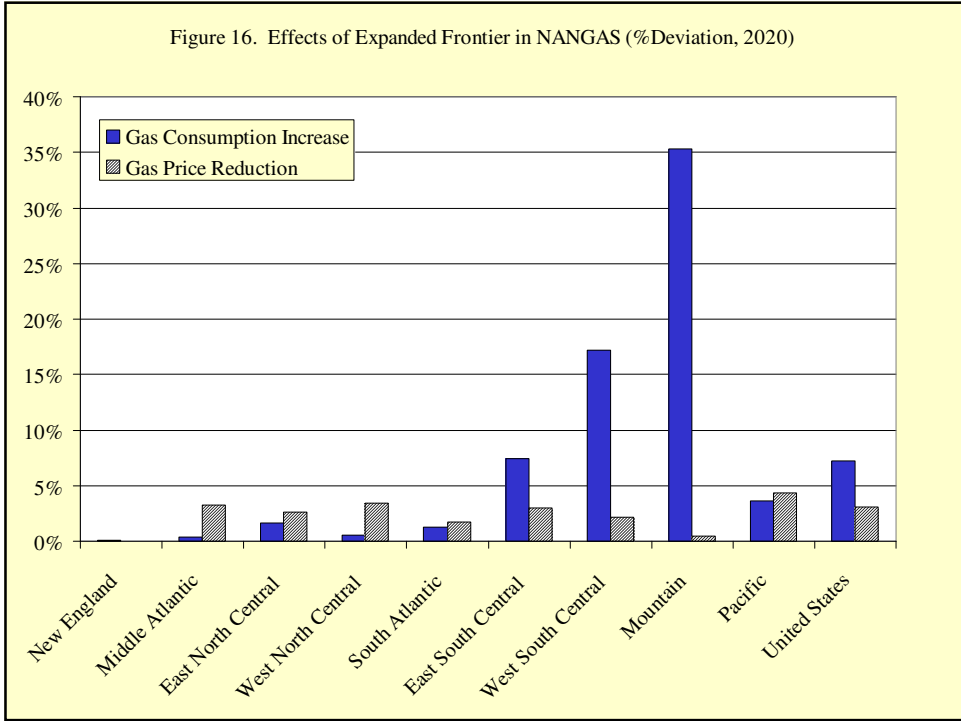


Figure 18. Percent Reduction in Consumption in 2020, Low Supply vs Reference

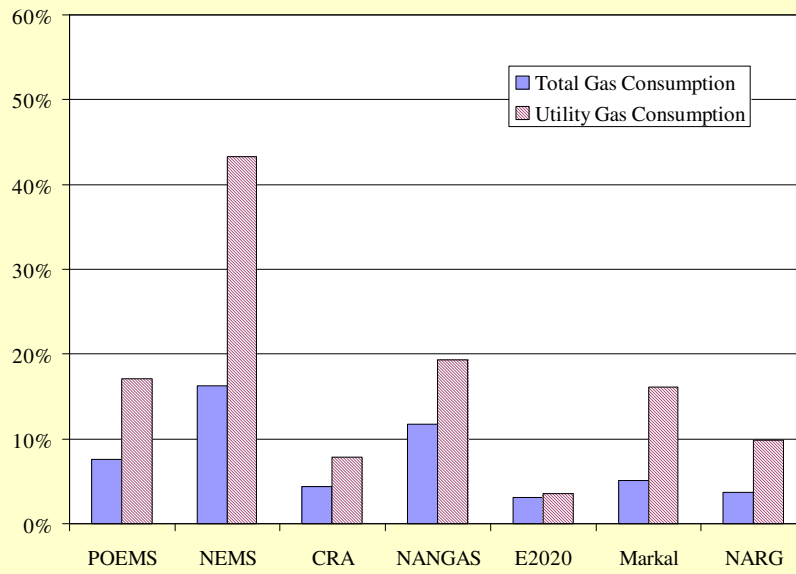


Figure 19. Percent Reduction in Consumption in 2020, Low Supply/High Demand vs High Demand

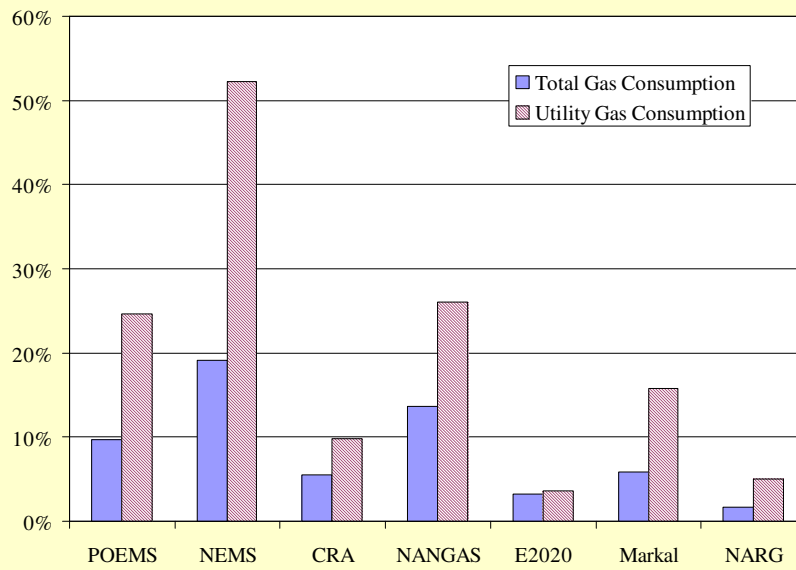


Figure 20. Regional Gas Supplies, Reference Case, 2020

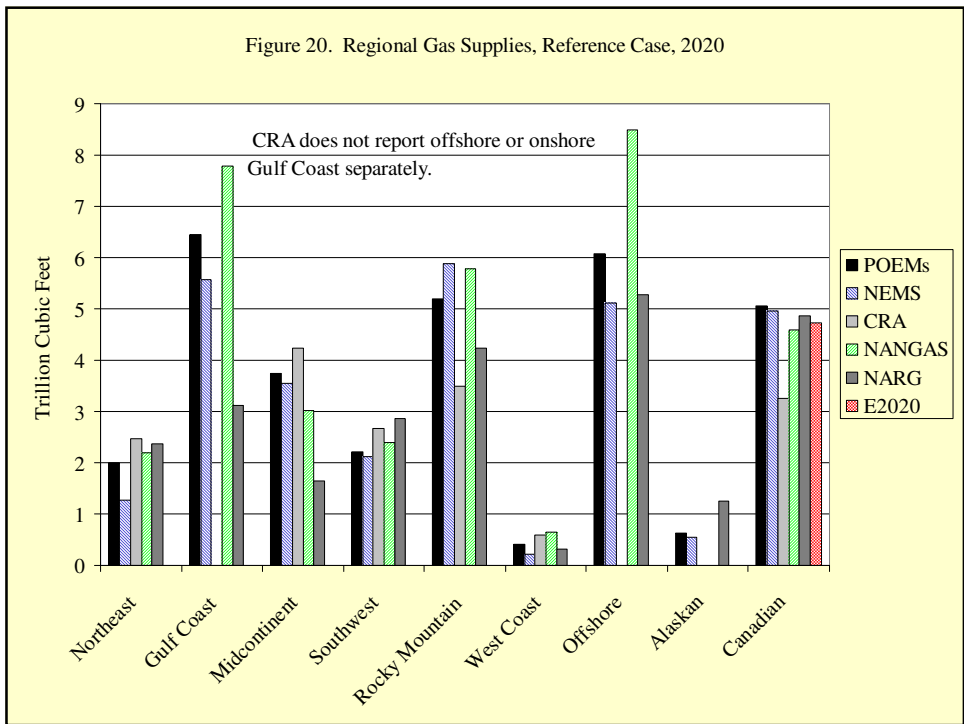
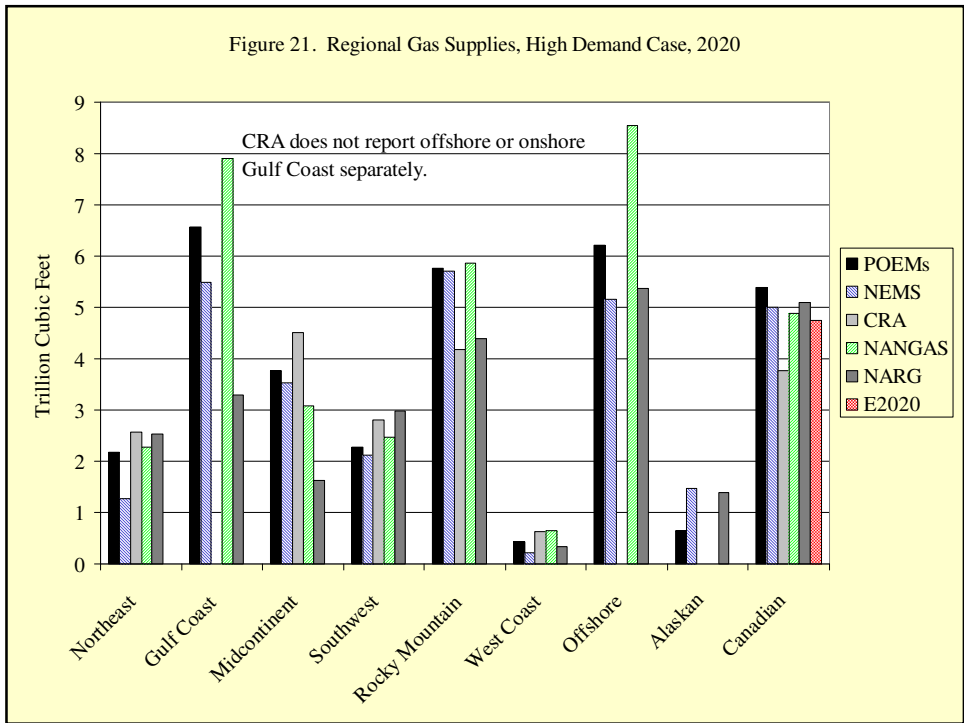


Figure 21. Regional Gas Supplies, High Demand Case, 2020



Some Tentative Conclusions

- Low oil prices, reduced drilling productivity and economic growth increase competitive pressure on natural gas.
- Power sector will be very sensitive to these conditions.
- Higher greenhouse gas emissions, unless new developments in nuclear, coal, renewables and energy efficiency.
- Expanded frontier could reduce price by 40 cents/mcf.
- Gas use: gas prices > renewable technology assumptions.
- Fuel competition: an important brake on gas prices.
- Severe pressures on gas competition are possible, even without a more pessimistic gas resource base.