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UJAE Summary

Energy Market Impacts of Alternative Greenhouse Gas Intensity Reduction Goals Energy Information Administration (EIA) March 2006

This study focuses on the effect of mandatory greenhouse gas (GHG) emissions cap-and-trade programs patterned after the proposal put forth by the National Commission on Energy Policy (NCEP). Senators Bingaman and Domenici are currently working on a proposal that is based on the NCEP deliberations. These proposals do not set an emissions reduction target in terms of tons of allowable emissions, but rather in terms of tons of emissions per dollar of real gross domestic product (GDP). This kind of target allows for more growth in GDP as the efficiency of using fossil fuels improves.

EIA sets up four main cases for evaluation. The goal for Case 1 is a reduction in greenhouse gas (GHG) emissions per dollar of GDP of 2.4% each year out to 2020, and a reduction of 2.8% each year from 2020 to 2030. The goals for each of the four cases are shown in a Table I below. A more stringent reduction target means fewer available permits for purchase and a higher permit price which would be passed on to consumers in the form of higher energy prices.

Emitters of GHG would have to buy a permit for each ton of carbon dioxide (CO₂) and other GHG they emit. In each case, there is a “safety-valve” price above which the price of permits is not allowed to rise.

Compared to the Business as Usual case, emissions would be 5 to 14% lower in 2020 and 9 to 28% lower by 2030.

Because coal contains the most carbon, coal prices would rise the most. The price of coal, in 2020, would be 52% higher in the least stringent case and 157% higher in the most stringent case. Gasoline prices would be raised between 6 and 19 cents per gallon, and electricity prices would increase in the 6 to 15% range. Prices would continue to rise out to 2030.

The use of coal, oil, and natural gas are below business as usual in each case, with coal showing a decline even below the 2004 levels in cases 3 and 4. Renewable energy sources and nuclear show an increase.

A major problem in this program is that coal, the nation’s cheapest and most abundant fuel, is limited the most in supplying future energy needs. An increase in research and development for carbon sequestration could provide a greater role for coal.

EIA projects that energy from renewables (non-hydro) will grow rapidly, rising from the current 2.2% of electricity generation to seven percent in Case 1 and 21% in Case 4 by 2030. This kind of growth comes with a lot of uncertainty, according to the study. While “such growth might lead to reductions in cost,” they might also run into “siting resistance,” and high costs of integration into the transmission system.

Nuclear energy generating capacity is projected to increase by 25 to 123 gigawatts by 2030, which means the construction of some 20 to 100 new plants. This appears ambitious in view of the fact that the most recent nuclear plant order was placed nearly 30 years ago.

Because real worker incomes are lowered by meeting the GHG targets, consumer spending and the nations output of goods and services are below the business as usual path.

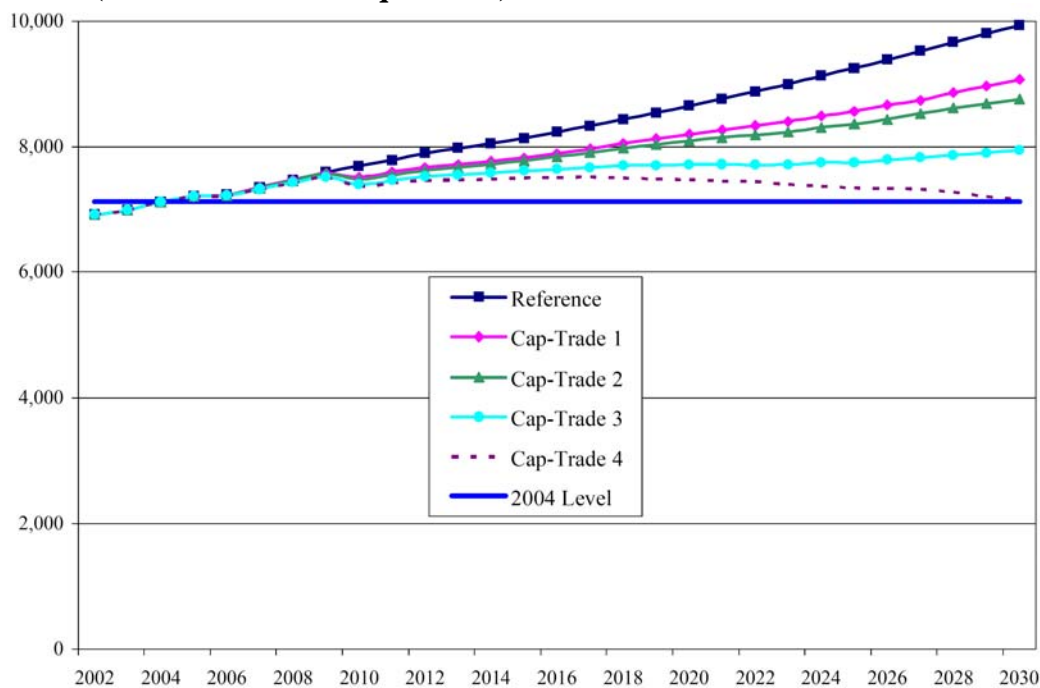
Unfortunately, the EIA study does not make an estimate of the impact on unemployment. Although the NCEP approach would be expected to raise unemployment by a smaller amount than the McCain-Lieberman approach, any program that limits energy growth and pushes up prices is likely to cause a significant displacement of workers.

The negative impact on the economy will be greater if the projected gains for nuclear and renewables are not met. The “safety valve” limit on the cost of GHG permits will limit the price of permits, but if the limit is reached, the targeted GHG reduction goals may not be achieved.

Table I: **Energy market Impacts of Alternative Greenhouse Gas Intensity Reduction Goals**
Energy Information Administration Study, March 2006

Case	GHG Intensity Reduction Goal Percent per year		Safety-Valve Price	
	2010-2019	2020-2030	2010	2030
Case 1	2.4	2.8	\$6.16	\$9.86
Case 2	2.6	3.0	\$8.83	\$14.13
Case 3	2.8	3.5	\$22.09	\$35.34
Case 4	3.0	4.0	\$30.92	\$49.47

EIA Study: Total Greenhouse Gas emissions in Alternative Cases, 2002-2030
(million metric ton equivalent)



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	2004	2020 Business As Usual		2020						
		Case 1	%Chg	Case 2	%Chg	Case 3	%Chg	Case 4	%Chg	
Emissions of greenhouse gases (million metric tons CO2 equivalent)										
Non-covered emissions	963	1,077	1,077		1,077		1,077		1,077	
Total covered emissions	6,159	7,571	7,121		7,014		6,635		6,396	
Total Emissions	7,122	8,649	8,198	-5%	8,091	-6%	7,712	-11%	7,473	-14%
Emissions reduction goal			2.4%		2.6%		2.8%		3.0%	
<i>Emissions change (millions of tons)</i>			-451		-558		-937		-1176	
Permit price (2004 dollars per metric ton CO2 equivalent)	NA	NA	\$7.80		\$11.10		\$21.90		\$23.70	
Energy Prices										
Motor gasoline (per gallon)	\$1.90	2.08	\$2.14	\$ 0.06	\$2.17	\$ 0.09	\$2.26	\$ 0.18	\$2.27	\$ 0.19
Natural Gas for Residential Customers	\$10.72	10.48	\$10.90	\$ 0.42	\$11.08	\$ 0.60	\$11.57	\$ 1.09	\$11.54	\$ 1.06
Coal (per short ton)	\$28.81	28.55	\$43.32	52%	\$49.55	74%	\$69.32	143%	\$73.21	\$ 1.56
Electricity (cents per kwh)	\$7.57	7.25	\$7.68	6%	\$7.89	9%	\$8.34	15%	\$8.33	15%
Fossil energy consumption (quadrillion Btu)										
Petroleum	40.1	48.1	47.2	-2%	47	-2%	46.5	-3%	46.5	-3%
Natural Gas	23.1	27.7	27.4	-1%	27.3	-1%	26.9	-3%	26.2	-5%
Coal	22.5	27.6	26.5	-4%	25.7	-7%	22.6	-18%	20.5	-26%
Electric power sector generation (billion kilowatthours)										
Total	3,799	4,835	4,785	-1%	4,758	-2%	4,701	-3%	4,703	-3%
Petroleum	115	92	34	-	34	-	28	-	26	-
Natural Gas	619	968	1,032	7%	1,022	6%	1,005	4%	909	-6%
Coal	1,954	2,435	2,353	-3%	2,281	-6%	1,990	-18%	1,801	-26%
Nuclear	789	871	871	0%	885	2%	926	6%	945	8%
Renewable	323	469	496	6%	536	14%	753	61%	1,023	118%
Real Gross Domestic Product GDP (billion 2000 \$) *										
Loss of Production due to Cap-and-Trade (billions of \$)	NA	NA	-13		-19		-41		-38	

* Real GDP is the total production of goods and services in the American economy

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	2004	2030 Business As Usual		2030						
		Case 1	%Chg	Case 2	%Chg	Case 3	%Chg	Case 4	%Chg	
Emissions of greenhouse gases (million metric tons CO2 equivalent)										
Non-covered emissions	963	1,189	1,189		1,189		1,189		1,189	
Total covered emissions	6,159	8,742	7,878		7,568		6,752		5,971	
Total Emissions	7,122	9,930	9,067	-9%	8,757	-12%	7,941	-20%	7,160	-28%
Emissions reduction goal			2.8%		3.0%		3.5%		4.0%	
Emissions change (millions of tons)			-863		-1173		-1989		-2770	
Permit price (2004 dollars per metric ton CO2 equivalent)	NA	NA	\$9.86		\$14.13		\$35.34		\$49.47	
Energy Prices										
Motor gasoline (per gallon)	\$1.90	2.19	\$2.27	\$ 0.08	\$2.31	\$ 0.12	\$2.48	\$ 0.29	\$2.60	\$ 0.41
Natural Gas for Residential Customers	\$10.72	11.67	\$12.25	\$ 0.58	\$12.53	\$ 0.86	\$13.52	\$ 1.85	\$14.24	\$ 2.57
Coal (per short ton)	\$28.81	30.30	\$47.71	57%	\$54.18	79%	\$93.88	210%	\$122.94	306%
Electricity (cents per kwh)	\$7.57	7.51	\$8.18	9%	\$8.48	13%	\$9.40	25%	\$9.74	30%
Fossil energy consumption (quadrillion Btu)										
Petroleum	40.1	53.6	52.3	-2%	52	-3%	50.9	-5%	50.3	-6%
Natural Gas	23.1	27.7	27.7	0%	27.8	0%	27	-3%	26.7	-4%
Coal	22.5	34.5	30	-13%	27.2	-21%	20.1	-42%	13.6	-61%
Electric power sector generation (billion kilowatthours)										
Total	3,799	5,503	5,461	-1%	5,421	-1%	5,272	-4%	5,211	-5%
Petroleum	115	101	35	-	35	-	27	-	22	-
Natural Gas	619	822	942	15%	956	16%	870	6%	851	4%
Coal	1,954	3,205	2,792	-13%	2,437	-24%	1,766	-45%	1,178	-63%
Nuclear	789	871	1,020	17%	1,166	34%	1,418	63%	1,762	102%
Renewable	323	504	672	33%	827	64%	1,191	136%	1,398	177%
Real Gross Domestic Product GDP (billion 2000 \$) *										
Loss of Production due to Cap-and-Trade (billions of \$)	NA	NA	-27		-35		-70		-128	

* Real GDP is the total production of goods and services in the American economy