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Biggest coal plants could ring up more than $100M in CO2 costs per year

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The cost of CO2 emissions from the heaviest emitting power plants in the United States could be staggering in even the first year of a carbon cap-and-trade program based on the current form of the American Clean Energy and Security Act of 2009. But given a normally functioning power market and reasonable regulatory outcomes, regulated and merchant power companies alike should face little trouble making up for the carbon costs of their coal-fired generation.

With the Senate electing to take a pass on tackling the Waxman-Markey bill before its August recess, SNL Energy put together an analysis of what the cost of CO2 emissions might be, based on the bill's House-passed provisions, for the 25 heaviest-emitting plants in the United States in the first year of the bill's cap-and-trade program.

Given three likely scenarios on CO2 prices of $10, $15 or $20 per ton at the onset of the Waxman-Markey carbon market and assuming the plants' emissions remain steady at recent levels, the highest-emitting merchant power plants could cost their owners at least $100 million in the first year of the program up to more than $200 million.

Energy Future Holdings Corp.'s merchant Martin Lake and Monticello coal-fired plants were both among the 25 heaviest-emitting plants in the country last year and, with a $10 per ton price of CO2, would cost the company about $190 million in the first year of the carbon market, given the same level of emissions. If the price of CO2 reached as high as $20 in the first year of the program, the two plants would cost Energy Future about $380 million.

Similarly, NRG Energy Inc.'s merchant W.A. Parish 5-8 and Limestone coal-fired plants, both among the country's 25 heaviest-emitting plants, would cost NRG nearly $180 million with a $10 price of CO2 and about $357 million with a $20 price of CO2.

As merchant coal plants, all four of those plants would receive free CO2 allowances for 50% of their emissions under Waxman-Markey allocation provisions, which Sanford C. Bernstein & Co. LLC analyst Hugh Wynne on July 29 told SNL Energy was the key to keeping merchant generators such as NRG and Energy Future's Luminant Generation Co. LLC from suffering any real negative financial impacts in the early years of the proposed cap-and-trade system.

All four of those plants are located in Texas where, as in much of the country, natural gas typically sets the price of power. Because merchant gas-fired generation will receive no free CO2 allowances and the fuel type also emits about 0.5 of a ton of CO2 per megawatt-hour, Wynne said power prices would go up about $5 per MWh in a scenario with a $10 per ton price of CO2 in Texas.

Because coal plants emit about 1 ton of CO2 per MWh, Wynne said merchant coal plants such as Martin Lake or the other Texas coal plants would get half of the $10 cost of CO2 returned in the form of higher gas-driven power prices and half from the government's free allocation of allowances.

"[Waxman-Markey] was carefully designed to pass through small price increases," Wynne said. This reiterated a point he made in his July 8 report looking at the consequences of Waxman-Markey that merchant generators will not really be hurt by the bill's carbon market until around 2026 to 2030, when free CO2 allowances are phased out.

On the regulated front, regulated utilities are scheduled to receive free CO2 allowances for 90% of their emissions and the other 10% should be routinely recovered by state regulators passing through the additional cost of CO2 to consumers.

Southern Co. owns all or part of the three heaviest-emitting power plants in the United States, but because of those plants' status as regulated facilities, the uncovered 10% of CO2 emissions from each plant would only cost between roughly $22 million and $27 million in a $10-per-ton of CO2 scenario and between about $43 million and $53 million for the emissions from each in a $20 CO2 scenario.

While Wynne said it would be highway robbery for regulators to deny any regulated utilities the right to pass through the cost of CO2 to customers, he did say the increased cost could act as a contributing factor in regulators making it much more difficult for utilities to raise their rates for other reasons, an indirect impact of CO2 that could quickly create a negative force on regulated utilities once the cap-and-trade program begins.

Many investors have worried that Waxman-Markey or any cap-and-trade system resulting in a price on carbon might lead to the early closing of some coal plants, but Wynne said Waxman-Markey by itself would not cause any coal plants to become uneconomical and in danger of being shut until near 2030.

With Wynne's analysis, it might seem Waxman-Markey will have little impact whatsoever at its onset. That is, of course, certainly untrue for consumers who will bear any brunt of CO2 costs, regardless of cost deflectors set up for power companies.

"The cost of federal climate regulations to consumers will vary by region, and will be strongly affected by the allocation scheme for emissions allowances," Synapse Energy Economics said in a July report, produced for the National Association of Regulatory Utility Commissioners, focusing on the consequences of federal climate legislation. "The details are important, however, and the choices made in designing greenhouse gas regulations can lead to costs or savings of tens of billions of consumer dollars every year."

But Waxman-Markey could cause some meaningful decision making with earnings implications for power companies from the carbon market's onset, if combined with other policy such as a new and more stringent Clean Air Interstate Rule, Wynne said.

With more stringent NOx and SO2 emissions limits under a new CAIR, considered a likely possibility as the U.S. Environmental Protection Agency works to issue a new rule, power companies will be forced to face the prospect of needing to quickly add expensive new NOx and SO2 controls, Wynne said. If a power company is considering spending hundreds of millions on new environmental equipment and sees it will only have a few years after the completion of the emissions controls before CO2 prices begin having a bigger impact because free allowances disappear, Wynne said the company might find it more economic to simply shut the coal plant years ahead of the 2026 to 2030 time frame because the company could not get a proper return on its investment for the NOx and SO2 controls before CO2 prices hurt the plant's financial prospects.

The future of allocations as Waxman-Markey evolves

While SNL Energy's analysis of CO2 emissions costs for heavy-emitting power plants is a best estimate based on the provisions of the Waxman-Markey bill at a critical juncture where it has been passed by the House and not yet tinkered with in the Senate, few believe the allowance allocation provisions will actually remain as they are.

With an entirely different makeup in the Senate, where coal state and moderate representatives have much more clout, more compromises on allocations will likely be needed to pass a Senate version of the climate bill. Duke Energy Corp. Chairman, President and CEO James Rogers on July 20 even went so far as to say the Senate will have to strike a different deal on allocating allowances to appease coal state senators.

Wynne said he believes the Senate will generally use Waxman-Markey as a base for its bill, especially considering it is not that different at its core from previous failed Senate climate bills, but that the Senate will probably modify the allowance allocation provisions.

The Bernstein analyst said there is virtually no chance that President Barack Obama's original suggestion of a 100% auction of allowances will re-enter the picture due to the makeup of the Senate, but did not otherwise hazard a guess on how the allocation provisions may be altered.

CO2 cost estimates from Waxman-Markey bill for top emitting coal plants

Plant	State	Current Op. capacity (MW)	2008 Net generation (MWh)	2008 CO2 emissions (tons)	Cost of carbon ($) at $10/ton CO2	Cost of carbon ($) at $15/ton CO2	Cost of carbon ($) at $20/ton CO2
Scherer	GA	3,421	24,348,774	26,543,605	26,543,605	39,815,408	53,087,210
Bowen	GA	3,222	22,233,226	22,164,809	22,164,809	33,247,214	44,329,618
James H. Miller Jr.	AL	2,750	21,372,796	21,968,554	21,968,554	32,952,831	43,937,108
Martin Lake	TX	2,250	17,737,379	21,023,701	105,118,505	157,677,758	210,237,010
Gibson	IN	3,157	21,903,413	20,609,837	20,609,837	30,914,756	41,219,674
Navajo	AZ	2,250	17,522,979	20,431,390	20,431,390	30,647,085	40,862,780
W.A. Parish 5-8	TX	2,460	18,916,509	20,108,335	100,541,675	150,812,513	201,083,350
Gen J M Gavin	OH	2,640	21,102,131	19,718,216	19,718,216	29,577,324	39,436,432
Monroe	MI	3,135	19,548,538	19,403,724	19,403,724	29,105,586	38,807,448
Colstrip	MT	2,094	16,086,750	19,213,973	32,902,007	49,353,011	65,804,015
Rockport	IN	2,620	19,900,735	18,858,253	56,574,759	84,862,139	113,149,518
Bruce Mansfield	PA	2,510	18,556,736	18,160,471	90,802,355	136,203,533	181,604,710
Monticello ST	TX	1,880	14,912,697	17,120,167	85,600,835	128,401,253	171,201,670
Cumberland	TN	2,532	16,294,738	17,034,409	17,034,409	25,551,614	34,068,818
Jim Bridger	WY	2,120	15,303,400	16,610,691	16,610,691	24,916,037	33,221,382
Sherburne County	MN	2,258	14,249,392	16,575,555	16,575,555	24,863,333	33,151,110
Belews Creek	NC	2,320	16,337,529	15,852,850	15,852,850	23,779,275	31,705,700
John E. Amos	WV	2,900	16,150,263	15,764,550	15,764,550	23,646,825	31,529,100
Paradise	KY	2,322	15,327,018	15,709,683	15,709,683	23,564,525	31,419,366
Limestone	TX	1,689	13,896,060	15,582,153	77,910,765	116,866,148	155,821,530
Jeffrey Energy Center	KS	2,190	13,383,376	15,404,516	15,404,516	23,106,774	30,809,032
Crystal River	FL	2,350	14,260,525	15,101,755	15,101,755	22,652,633	30,203,510
Labadie	MO	2,427	17,409,127	15,089,572	15,089,572	22,634,358	30,179,144
Four Corners	NM	2,060	14,683,708	15,015,846	15,015,846	22,523,769	30,031,692
Roxboro	NC	2,447	15,272,104	14,950,235	14,950,235	22,425,353	29,900,470

Note: CO2 cost estimates are based on 2008 plant CO2 emissions. Simplifying assumptions are taken from the Waxman-Markey bill with regard to the allowances issued for emitting sources. Under these assumptions, merchant coal owners initially would be issued free allowances for 50% of their emissions while regulated owners would be issued for free 90% of the allowances needed to cover their emissions. An emissions cost is estimated for each ownership share in the plant based on the regulatory status of the owner. We use three scenarios for the price of carbon — $10, $15 and $20 per ton. The owners' CO2 emissions expenses, less their free allowances, are then aggregated to get a whole plant number. This represents the initial realized cost of carbon for coal plants in the first year of operation under the Waxman-Markey bill's currently proposed cap-and-trade program.
Source: SNL Energy