Annual Cost-Effectiveness (regulation, PM only)

10/17/2003

The variable used to establish the low and high end scenarios is the annual usage;
1,200 hours/year for the low end (typical short-haul usage) and 3,000 hours/year for the high end (typical long-haul usage.)

VDECS Retrofit: Low-Cost Scenario

Operator Cost Range (2002 $)
(basis for calculations below) Interest rate for 2008 Cost Pmt. Adj.: 0.05
$78,760 $2,346,240

Year	Emission Benefits (tpy)	Annual In-Use Cost (2002 $) (low-cost scenario)	Annual Operator Reporting Cost Range (low)	(high)	In-Use & Operating Costs = Total Ann. Operating Cost (low)	(high)	2008 In-Use Cost Payment Adj. [1] (low)	(high)	PM Cost Effectiveness (In-Use & Rept. Costs Only) $/lb. (low)	$/lb (high)	Not Used for Cost-Effectiveness Calculation Fac. Rep. Cost Range (low)	(high)	Total Annual Cost (low)	(high)
2000		$0	$0	$0	$0	$0								
2001		$0	$0	$0	$0	$0								
2002		$0	$0	$0	$0	$0								
2003		$0	$0	$0	$0	$0								
2004		$0	$0	$0	$0	$0								
2005		$0	$0	$0	$0	$0								
2006		$0	$0	$0	$0	$0								
2007		$0	$0	$0	$0	$0								
2008	0.000	$5,509,003	$52,481	$1,563,399	$5,561,484	$7,072,402			See Footnote 1		$198,200	$5,145,153	$198,200	$5,145,153
2009	213.890	$5,944,029			$5,944,029	$5,944,029	$6,602,879	$6,781,873	15.44	15.85	$198,200	$5,145,153	$6,801,079	$11,927,026
2010	219.000	$6,222,225			$6,222,225	$6,222,225	$6,881,075	$7,060,069	15.71	16.12	$198,200	$5,145,153	$7,079,275	$12,205,222
2011	253.675	$6,489,439			$6,489,439	$6,489,439	$7,148,289	$7,327,283	14.09	14.44	$198,200	$5,145,153	$7,346,489	$12,472,436
2012	269.735	$6,746,534			$6,746,534	$6,746,534	$7,405,385	$7,584,378	13.73	14.06	$198,200	$5,145,153	$7,603,585	$12,729,531
2013	279.225	$6,993,685			$6,993,685	$6,993,685	$7,652,536	$7,831,529	13.70	14.02	$198,200	$5,145,153	$7,850,736	$12,976,682
2014	286.890	$7,232,186			$7,232,186	$7,232,186	$7,891,036	$8,070,030	13.75	14.06	$198,200	$5,145,153	$8,089,236	$13,215,183
2015	296.015	$7,461,809			$7,461,809	$7,461,809	$8,120,659	$8,299,653	13.72	14.02	$198,200	$5,145,153	$8,318,859	$13,444,806
2016	293.825	$7,683,852			$7,683,852	$7,683,852	$8,342,703	$8,521,696	14.20	14.50	$198,200	$5,145,153	$8,540,903	$13,666,849
2017	242.360	$7,898,202			$7,898,202	$7,898,202	$8,557,052	$8,736,046	17.65	18.02	$198,200	$5,145,153	$8,755,252	$13,881,199
2018	222.650	$4,723,774			$4,723,774	$4,723,774	$5,382,624	$5,561,618	12.09	12.49	$198,200	$5,145,153	$5,580,824	$10,706,771
2019	204.035	$4,657,703			$4,657,703	$4,657,703	$5,316,553	$5,495,547	13.03	13.47	$198,200	$5,145,153	$5,514,753	$10,640,700
2020	191.625	$4,175,634			$4,175,634	$4,175,634	**$4,834,485**	$5,013,478	12.61	13.08	$198,200	$5,145,153	$5,032,685	$10,158,631
	2972.925 Tons PM Reduced (13 Yrs.)					Totals:	**$84,135,277**	$86,283,198	**12**	18	$2,576,600	$66,886,989	**$86,711,877**	$153,170,187
									Minimum	Maximum				Total Cost Range (2002 $)

[1]These columns take the 2008 in-use cost and converts it into uniform payments for the years 2009 - 2020
by doing the following: converting the 2008 in-use cost to 2009 dollars, and then converting that amount to a uniform payment series; interest rate used is 5%.
This calculation is performed to account for the 2008 in-use costs, since a cost-effectiveness figure cannot be calculated for this year due to zero PM emission reduction.

VDECS Retrofit: High-Cost Scenario

Operator Cost Range (2002 $)
(basis for calculations below)
$78,760 $2,346,240

Year	Emission Benefits (tpy)	Annual In-Use Cost (2002$) (high-cost scenario)	Annual Operator Reporting Cost Range (low)	(high)	In-Use & Operating Costs = Total Ann. Operating Cost (low)	(high)	2008 In-Use Cost Payment Adj. [1] (low)	(high)	PM Cost Effectiveness (In-Use & Rept. Costs Only) $/lb. (low)	$/lb (high)	Not Used for Cost-Effectiveness Calculation Fac. Rep. Cost Range (low)	(high)	Total Annual Cost (low)	(high)
2000		$0	$0	$0	$0	$0								
2001		$0	$0	$0	$0	$0								
2002		$0	$0	$0	$0	$0								
2003		$0	$0	$0	$0	$0								
2004		$0	$0	$0	$0	$0								
2005		$0	$0	$0	$0	$0								
2006		$0	$0	$0	$0	$0								
2007		$0	$0	$0	$0	$0								
2008	0.000	$5,800,773	$52,481	$1,563,399	$5,853,255	$7,364,172			See Footnote 1		$198,200	$5,145,153	$198,200	$5,145,153
2009	213.890	$6,262,573			$6,262,573	$6,262,573	$6,955,989	$7,134,982	16.26	16.68	$198,200	$5,145,153	$7,154,189	$12,280,135
2010	219.000	$6,525,600			$6,525,600	$6,525,600	$7,219,016	$7,398,009	16.48	16.89	$198,200	$5,145,153	$7,417,216	$12,543,162
2011	253.675	$6,778,368			$6,778,368	$6,778,368	$7,471,784	$7,650,777	14.73	15.08	$198,200	$5,145,153	$7,669,984	$12,795,930
2012	269.735	$7,021,705			$7,021,705	$7,021,705	$7,715,120	$7,894,114	14.30	14.63	$198,200	$5,145,153	$7,913,320	$13,039,267
2013	279.225	$7,255,753			$7,255,753	$7,255,753	$7,949,168	$8,128,162	14.23	14.55	$198,200	$5,145,153	$8,147,368	$13,273,315
2014	286.890	$7,481,774			$7,481,774	$7,481,774	$8,175,189	$8,354,183	14.25	14.56	$198,200	$5,145,153	$8,373,389	$13,499,336
2015	296.015	$7,699,512			$7,699,512	$7,699,512	$8,392,927	$8,571,921	14.18	14.48	$198,200	$5,145,153	$8,591,127	$13,717,074
2016	293.825	$7,910,236			$7,910,236	$7,910,236	$8,603,651	$8,782,645	14.64	14.95	$198,200	$5,145,153	$8,801,851	$13,927,798
2017	242.360	$8,113,805			$8,113,805	$8,113,805	$8,807,221	**$8,986,214**	18.17	18.54	$198,200	$5,145,153	$9,005,421	$14,131,367
2018	222.650	$4,749,989			$4,749,989	$4,749,989	$5,443,404	$5,622,398	12.22	12.63	$198,200	$5,145,153	$5,641,604	$10,767,551
2019	204.035	$4,657,703			$4,657,703	$4,657,703	$5,351,118	$5,530,112	13.11	13.55	$198,200	$5,145,153	$5,549,318	$10,675,265
2020	191.625	$4,175,634			$4,175,634	$4,175,634	$4,869,050	$5,048,043	12.70	13.17	$198,200	$5,145,153	$5,067,250	$10,193,196
	2972.925 Tons PM Reduced (13 Yrs.)					Totals:	$86,953,637	**$89,101,558**	12	**19**	$2,576,600	$66,886,989	$89,530,237	**$155,988,547**
									Minimum	**Maximum**				Total Cost Range (2002 $)

[1]These columns take the 2008 in-use cost and converts it into uniform payments for the years 2009 - 2020
by doing the following: converting the 2008 costs to 2009 dollars, and then converting that amount to a uniform payment series; interest rate used is 5%.
This calculation is performed to account for the 2008 in-use costs, since a cost-effectiveness figure cannot be calculated for this year due to zero PM emission reduction.