

APPENDIX G

**COST-EFFECTIVENESS LIMIT AND
CAPITAL RECOVERY FACTORS**

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CARL MOYER PROGRAM REVISED COST-EFFECTIVENESS LIMIT AND CAPITAL RECOVERY FACTORS

Per statute, Air Resources Board (ARB or the Board) updates the cost-effectiveness limit and capital recovery factors annually. As of the approval of this appendix, the cost-effectiveness limit is \$16,640 per weighted ton of pollutants reduced and the discount rate to determine capital recovery factors for various projects lives is two percent. The revised cost-effectiveness limit and capital recovery factors may be used by air districts once the Board adopts the 2011 Carl Moyer Program Guidelines, but must be used by July 1, 2011. ARB will update these factors annually through a mail-out.

Revised Cost Effectiveness Limit

In order to receive Carl Moyer Program funding, each project must meet the specified maximum cost-effectiveness limit. Cost-effectiveness is a measure of the dollars provided to a project for each ton of covered emissions reduced. To calculate Carl Moyer Program cost-effectiveness, the project grant amount is annualized based upon the project's life and an appropriate discount rate. This annual cost is divided by the project's estimated emission reductions to determine the overall cost-effectiveness of the covered emissions reduced as indicated in Appendix C.

Using the California Consumer Price Index (<http://www.dir.ca.gov/dlsr/CPI/PresentCCPI.PDF> and <http://www.dir.ca.gov/dlsr/CPI/EntireCCPI.PDF>), the California Department of Finance method (http://www.dof.ca.gov/HTML/FS_DATA/LatestEconData/FS_UseCPI.php) of converting the Consumer Price Index to an inflation rate, a change in the cost-effectiveness limit can be determined over a specified time period (annually). Table G-1 shows the changes in the cost-effectiveness limit over time based on changes in the Consumer Price Index.

**Table G-1
Cost-Effectiveness Limit Criteria**

Year	Annual CA CPI	Percent change (inflation rate)	Annual modified amount	Revised CE cap
1998	163.7	NA	NA	\$12,000
1999	168.5	2.93%	\$352	\$12,352
2000	174.8	3.74%	\$462	\$12,814
2001	181.7	3.95%	\$506	\$13,319
2002	186.1	2.42%	\$323	\$13,642
2003	190.4	2.31%	\$315	\$13,957
2004	195.4	2.63%	\$367	\$14,324
2005	202.6	3.68%	\$528	\$14,852
2006	210.5	3.90%	\$579	\$15,431
2007	217.4	3.28%	\$506	\$15,936
2008	224.8	3.40%	\$542	\$16,479
2009	224.1	-0.31%	-\$51	\$16,428
2010	227.0	1.29%	\$212	\$16,640

Revised Capital Recovery Factors

The capital recovery factors (CRF) used for determining the annualized costs of Carl Moyer Program grants are based on a discount rate. The CRF uses an interest rate and project life to determine the rate at which earnings could reasonably be expected if the same funds were invested over a length of time.

Previous versions of the guidelines, updated the CRF using the average annual yield of United States (U.S.) Treasury securities (<http://federalreserve.gov/releases/h15/>) with a 3-year, 5-year, 7-year, and 10-year maturation over a specific period of time. Most recent annual data for 2010 using the average rates of return for U.S. Treasury securities over the past year (January to December 2010) yields a revised discount rate as shown in Table G-2 below:

**Table G-2
Discount Rate Factor**

Average Monthly Rate - 2010													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
3 year	1.49%	1.40%	1.51%	1.64%	1.32%	1.17%	0.98%	0.78%	0.74%	0.57%	0.67%	0.99%	1.11%
5 year	2.48%	2.36%	2.43%	2.58%	2.18%	2.00%	1.76%	1.47%	1.41%	1.18%	1.35%	1.93%	1.93%
7 year	3.21%	3.12%	3.16%	3.28%	2.86%	2.66%	2.43%	2.10%	2.05%	1.85%	2.02%	2.66%	2.62%
10 year	3.73%	3.69%	3.73%	3.85%	3.42%	3.20%	3.01%	2.70%	2.65%	2.54%	2.76%	3.29%	3.21%
Overall average for January-December 2010													2.22%

Rounding to a whole number yields a discount rate of two percent in Table G-2 above. Refer to Table G-3 below for CRF for various projects lives at a two percent discount rate. Each source category chapter will specify which projects lives are acceptable to determine which CRF value to use.

Table G-3
Capital Recovery Factors (CRF) for Various Project Lives
At a Two Percent Discount Rate (As of April 2011)

Project Life	CRF
1	1.020
2	0.515
3	0.347
4	0.263
5	0.212
6	0.179
7	0.155
8	0.137
9	0.123
10	0.111
11	0.102
12	0.095
13	0.088
14	0.083
15	0.078
16	0.074
17	0.070
18	0.067
19	0.064
20	0.061