

Utility AMI / Smart Grid projects - Assumptions used in Calculation of Net Present Value & /or Benefit / Cost Analysis (with Note 1)					
State & Utility	Docket	Input assumptions		Citations	
		Discount Rate (%)	Time Horizon (Years)	Discount Rate	Time Horizon
Arkansas					
Oklahoma Gas & Electric	10-109-U	8.124	15	Scott, Direct, page 13, line 21	Response APSC 001-08 Att
California					
Pacific Gas and Electric	A.05-06-028	7.6	20	PUC Decision 06-07-027; page 49	PUC Decision 06-07-027; page 28
San Diego Gas And Electric	A.05-03-015	8.23	17	PUC Decision 07-04-043, page 25	PUC Decision 07-04-043, page 32
District of Columbia					
Potomac Electric Power (1)	NJ EO07110881	7.09	15	Exhibit C, page 55	Exhibit B, page 6
Maryland					
BG&E	Case No. 9208	8.49	10	Exhibit DMV-1, page 8	Order No. 83410, page 46
Potomac Electric Power (1)	NJ EO07110881	7.17	15	Exhibit C, page 55	Exhibit B, page 6
New Jersey					
Atlantic City Electric (1)	NJ EO07110881	6.69	15	Exhibit C, page 55	Exhibit B, page 6
Nevada					
Nevada Power	10 - 02009	8.75	20	Response to Staff 463	Response to Staff 463
Sierra Pacific	10 - 03023				
Pennsylvania					
West Penn Power	M-2009-2123951	8.954	15	Hornby, Direct, Exhibit ____ (JRH-4)	
Note 1.					
"Blueprint for the Future" that ACE filed in New Jersey contains analyses for PEPCO DC and PEPCO MD					



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

January 3, 2012

M-12-06

MEMORANDUM FOR THE HEADS OF DEPARTMENTS AND AGENCIES

FROM: Jacob J. Lew
Director 

SUBJECT: 2012 Discount Rates for OMB Circular No. A-94

On October 29, 1992, OMB issued a revision to OMB Circular No. A-94, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs." The revision established new discount rate guidelines for use in benefit-cost and other types of economic analysis.

The revised Circular specifies certain discount rates that will be updated annually when the interest rate and inflation assumptions in the budget are changed. These discount rates are found in Appendix C of the revised Circular. The attachment to this memorandum is an update of Appendix C. It provides discount rates that will be in effect for the calendar year 2012.

The rates presented in Appendix C do not apply to regulatory analysis or benefit-cost analysis of public investment. They are to be used for lease-purchase and cost-effectiveness analysis, as specified in the Circular.

Attachment

APPENDIX C
(Revised December 2011)

**DISCOUNT RATES FOR COST-EFFECTIVENESS, LEASE PURCHASE,
AND RELATED ANALYSES**

Effective Dates. This appendix is updated annually. This version of the appendix is valid for calendar year 2012. A copy of the updated appendix can be obtained in electronic form through the OMB home page at http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c/. The text of the Circular is found at http://www.whitehouse.gov/omb/circulars_a094/, and a table of past years' rates is located at <http://www.whitehouse.gov/sites/default/files/omb/assets/a94/dischist.pdf>. Updates of the appendix are also available upon request from OMB's Office of Economic Policy (202-395-3381).

Nominal Discount Rates. A forecast of nominal or market interest rates for calendar year 2012 based on the economic assumptions for the 2013 Budget are presented below. These nominal rates are to be used for discounting nominal flows, which are often encountered in lease-purchase analysis.

**Nominal Interest Rates on Treasury Notes and Bonds
of Specified Maturities (in percent)**

<u>3-Year</u>	<u>5-Year</u>	<u>7-Year</u>	<u>10-Year</u>	<u>20-Year</u>	<u>30-Year</u>
1.6	2.1	2.5	2.8	3.5	3.8

Real Discount Rates. A forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions from the 2013 Budget is presented below. These real rates are to be used for discounting constant-dollar flows, as is often required in cost-effectiveness analysis.

**Real Interest Rates on Treasury Notes and Bonds
of Specified Maturities (in percent)**

<u>3-Year</u>	<u>5-Year</u>	<u>7-Year</u>	<u>10-Year</u>	<u>20-Year</u>	<u>30-Year</u>
0.0	0.4	0.7	1.1	1.7	2.0

Analyses of programs with terms different from those presented above may use a linear interpolation. For example, a four-year project can be evaluated with a rate equal to the average of the three-year and five-year rates. Programs with durations longer than 30 years may use the 30-year interest rate.

CIRCULAR A-94

GUIDELINES AND DISCOUNT RATES

FOR BENEFIT-COST ANALYSIS OF FEDERAL PROGRAMS

MEMORANDUM FOR HEADS OF EXECUTIVE DEPARTMENTS AND ESTABLISHMENTS

SUBJECT: Guidelines and Discount Rates for Benefit-Cost Analysis
of Federal Programs

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1. **Purpose.** The goal of this Circular is to promote efficient resource allocation through well-informed decision-making by the Federal Government. It

value. Transfers that arise as a result of the program or project being analyzed should be identified as such, however, and their distributional effects discussed. It should also be recognized that a transfer program may have benefits that are less than the program's real economic costs due to inefficiencies that can arise in the program's delivery of benefits and financing.

- b. Measuring Benefits and Costs. The principle of *willingness-to-pay* provides an aggregate measure of what individuals are willing to forego to obtain a given benefit. Market prices provide an invaluable starting point for measuring willingness-to-pay, but prices sometimes do not adequately reflect the true value of a good to society. Externalities, monopony power, and taxes or subsidies can distort market prices.

Taxes, for example, usually create an *excess burden* that represents a net loss to society. (The appropriate method for recognizing this excess burden in public investment analyses is discussed in Section 11.) In other cases, market prices do not exist for a relevant benefit or cost. When market prices are distorted or unavailable, other methods of valuing benefits may have to be employed. Measures derived from actual market behavior are preferred when they are available.

- (1) Inframarginal Benefits and Costs. Consumers would generally be willing to pay more than the market price rather than go entirely without a good they consume. The economist's concept of *consumer surplus* measures the extra value consumers derive from their consumption compared with the value measured at market prices. When it can be determined, consumer surplus provides the best measure of the total benefit to society from a government program or project. Consumer surplus can sometimes be calculated by using econometric methods to estimate consumer demand.
- (2) Indirect Measures of Benefits and Costs. Willingness-to-pay can sometimes be estimated indirectly through changes in land values, variations in wage rates, or other methods. Such methods are most reliable when they are based on actual market transactions. Measures should be consistent with basic economic principles and should be replicable.
- (3) Multiplier Effects. Generally, analyses should treat resources as if they were likely to be fully employed. Employment or output multipliers that purport to measure the secondary effects of government expenditures on employment and output should not be included in measured social benefits or costs.

7. Treatment of Inflation. Future inflation is highly uncertain. Analysts should avoid having to make an assumption about the general rate of inflation whenever possible.

- a. Real or Nominal Values. Economic analyses are often most readily accomplished using *real* or *constant-dollar* values, i.e., by measuring benefits and costs in units of stable purchasing power. (Such estimates may reflect expected future changes in relative prices, however, where

there is a reasonable basis for estimating such changes.) Where future benefits and costs are given in *nominal* terms, i.e., in terms of the future purchasing power of the dollar, the analysis should use these values rather than convert them to constant dollars as, for example, in the case of lease-purchase analysis.

Nominal and real values must not be combined in the same analysis. Logical consistency requires that analysis be conducted either in constant dollars or in terms of nominal values. This may require converting some nominal values to real values, or vice versa.

- b. Recommended Inflation Assumption. When a general inflation assumption is needed, the rate of increase in the Gross Domestic Product deflator from the Administration's economic assumptions for the period of the analysis is recommended. For projects or programs that extend beyond the six-year budget horizon, the inflation assumption can be extended by using the inflation rate for the sixth year of the budget forecast. The Administration's economic forecast is updated twice annually, at the time the budget is published in January or February and at the time of the Mid-Session Review of the Budget in July. Alternative inflation estimates, based on credible private sector forecasts, may be used for sensitivity analysis.

8. Discount Rate Policy. In order to compute net present value, it is necessary to discount future benefits and costs. This discounting reflects the time value of money. Benefits and costs are worth more if they are experienced sooner. All future benefits and costs, including nonmonetized benefits and costs, should be discounted. The higher the discount rate, the lower is the present value of future cash flows. For typical investments, with costs concentrated in early periods and benefits following in later periods, raising the discount rate tends to reduce the net present value. (Technical guidance on discounting and a table of *discount factors* are provided in Appendix B.)

- a. Real versus Nominal Discount Rates. The proper discount rate to use depends on whether the benefits and costs are measured in real or nominal terms.
 - (1) A real discount rate that has been adjusted to eliminate the effect of expected inflation should be used to discount constant-dollar or real benefits and costs. A real discount rate can be approximated by subtracting expected inflation from a nominal interest rate.
 - (2) A nominal discount rate that reflects expected inflation should be used to discount nominal benefits and costs. Market interest rates are nominal interest rates in this sense.
- b. Public Investment and Regulatory Analyses. The guidance in this section applies to benefit-cost analyses of public investments and regulatory programs that provide benefits and costs to the general public. Guidance related to cost-effectiveness analysis of internal planning decisions of the Federal Government is provided in Section 8.c.

In general, public investments and regulations displace both private investment and consumption. To account for this displacement and to promote efficient investment and regulatory policies, the following guidance should be observed.

(1) Base-Case Analysis. Constant-dollar benefit-cost analyses of proposed investments and regulations should report net present value and other outcomes determined using a real discount rate of 7 percent. This rate approximates the marginal pretax rate of return on an average investment in the private sector in recent years. Significant changes in this rate will be reflected in future updates of this Circular.

(2) Other Discount Rates. Analyses should show the sensitivity of the discounted net present value and other outcomes to variations in the discount rate. The importance of these alternative calculations will depend on the specific economic characteristics of the program under analysis. For example, in analyzing a regulatory proposal whose main cost is to reduce business investment, net present value should also be calculated using a higher discount rate than 7 percent.

Analyses may include among the reported outcomes the *internal rate of return* implied by the stream of benefits and costs. The internal rate of return is the discount rate that sets the net present value of the program or project to zero. While the internal rate of return does not generally provide an acceptable decision criterion, it does provide useful information, particularly when budgets are constrained or there is uncertainty about the appropriate discount rate.

(3) Using the *shadow price of capital* to value benefits and costs is the analytically preferred means of capturing the effects of government projects on resource allocation in the private sector. To use this method accurately, the analyst must be able to compute how the benefits and costs of a program or project affect the allocation of private consumption and investment. OMB concurrence is required if this method is used in place of the base case discount rate.

c. Cost-Effectiveness, Lease-Purchase, Internal Government Investment, and Asset Sales Analyses. The Treasury's borrowing rates should be used as discount rates in the following cases:

(1) Cost-Effectiveness Analysis. Analyses that involve constant-dollar costs should use the real Treasury borrowing rate on marketable securities of comparable maturity to the period of analysis. This rate is computed using the Administration's economic assumptions for the budget, which are published in January of each year. A table of discount rates based on the expected interest rates for the first year of the budget forecast is presented in Appendix C of this Circular. Appendix C is updated annually and is available upon request from OMB. Real Treasury rates are obtained by removing expected inflation over the period of analysis from nominal Treasury interest rates. (Analyses that involve nominal costs should use

nominal Treasury rates for discounting, as described in the following paragraph.)

- (2) Lease-Purchase Analysis. Analyses of nominal lease payments should use the nominal Treasury borrowing rate on marketable securities of comparable maturity to the period of analysis. Nominal Treasury borrowing rates should be taken from the economic assumptions for the budget. A table of discount rates based on these assumptions is presented in Appendix C of this Circular, which is updated annually. (Constant dollar lease-purchase analyses should use the real Treasury borrowing rate, described in the preceding paragraph.)
- (3) Internal Government Investments. Some Federal investments provide "internal" benefits which take the form of increased Federal revenues or decreased Federal costs. An example would be an investment in an energy-efficient building system that reduces Federal operating costs. Unlike the case of a Federally funded highway (which provides "external" benefits to society as a whole), it is appropriate to calculate such a project's net present value using a comparable-maturity Treasury rate as a discount rate. The rate used may be either nominal or real, depending on how benefits and costs are measured.

Some Federal activities provide a mix of both Federal cost savings and external social benefits. For example, Federal investments in information technology can produce Federal savings in the form of lower administrative costs and external social benefits in the form of faster claims processing. The net present value of such investments should be evaluated with the 7 percent real discount rate discussed in Section 8.b. unless the analysis is able to allocate the investment's costs between provision of Federal cost savings and external social benefits. Where such an allocation is possible, Federal cost savings and their associated investment costs may be discounted at the Treasury rate, while the external social benefits and their associated investment costs should be discounted at the 7 percent real rate.

- (4) Asset Sale Analysis. Analysis of possible asset sales should reflect the following:
 - (a) The net present value to the Federal Government of holding an asset is best measured by discounting its future earnings stream using a Treasury rate. The rate used may be either nominal or real, depending on how earnings are measured.
 - (b) Analyses of government asset values should explicitly deduct the cost of expected defaults or delays in payment from projected cash flows, along with government administrative costs. Such analyses should also consider explicitly the probabilities of events that would cause the asset to become nonfunctional, impaired or obsolete, as well as probabilities of events that would increase asset value.
 - (c) Analyses of possible asset sales should assess the gain in social efficiency that can result when a government asset is subject to market discipline and private incentives. Even