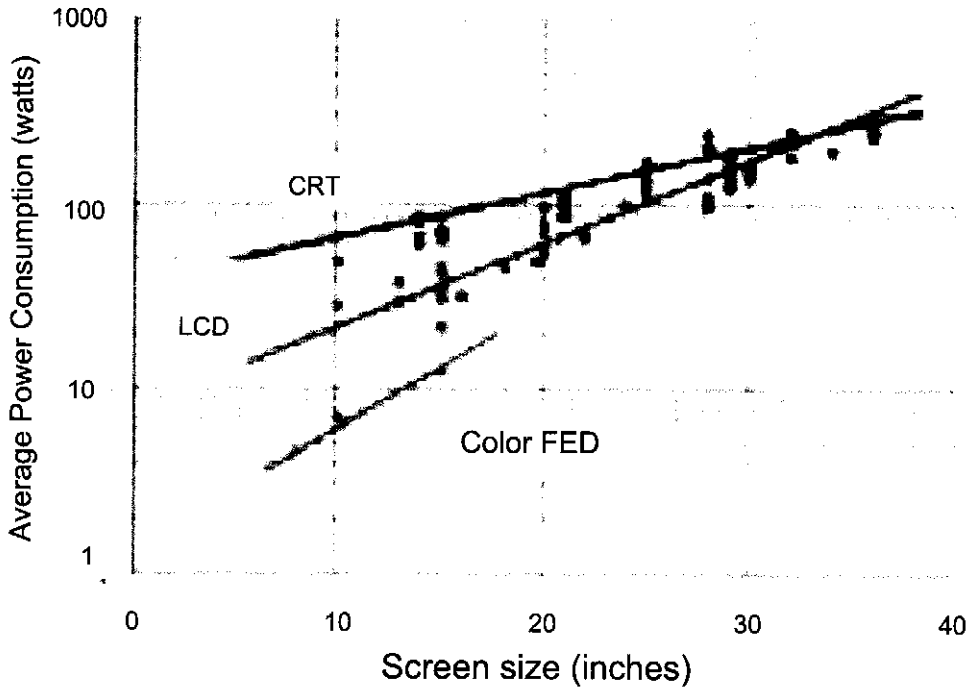
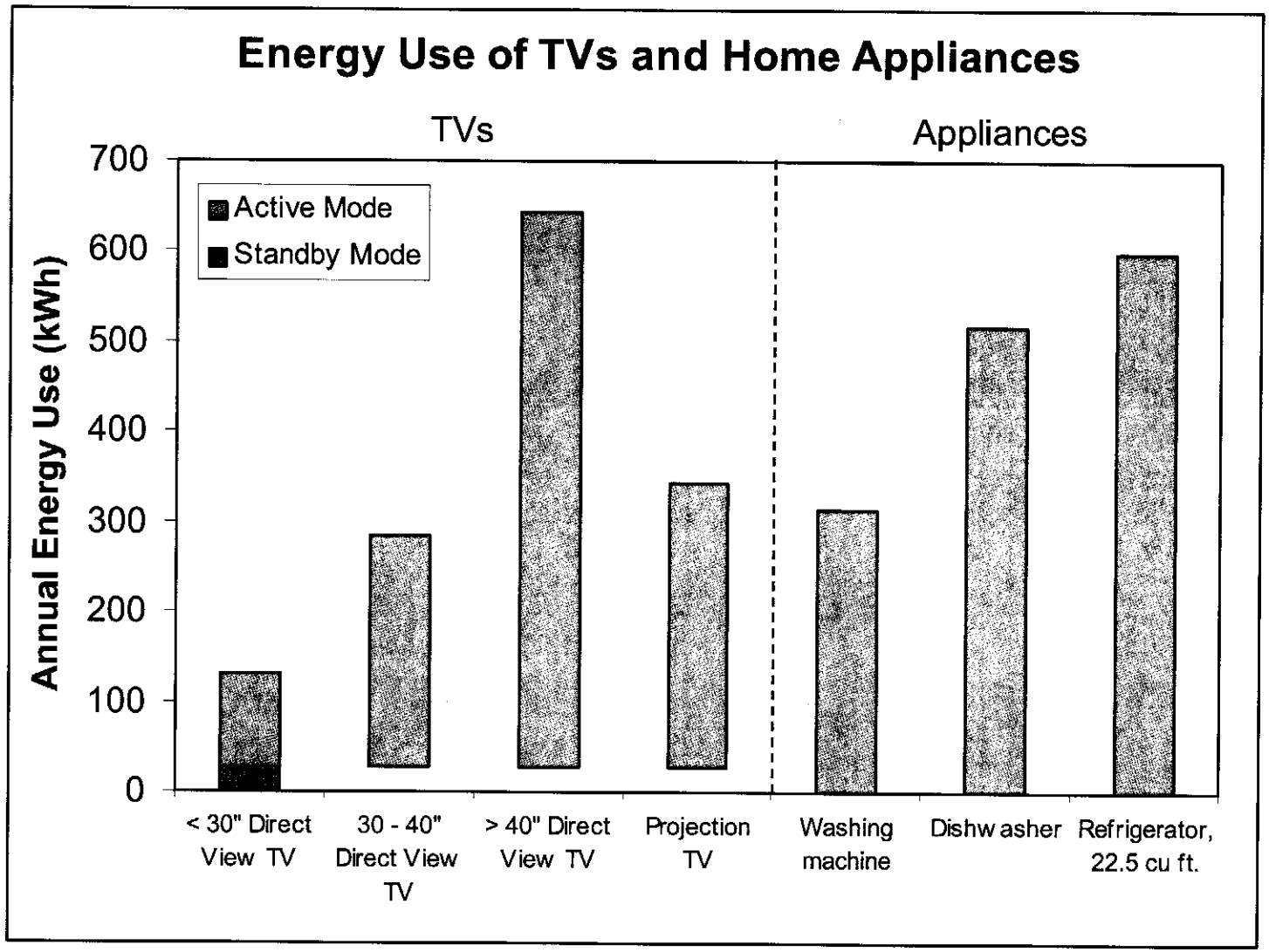
Future technologies provide hope of increased efficiency



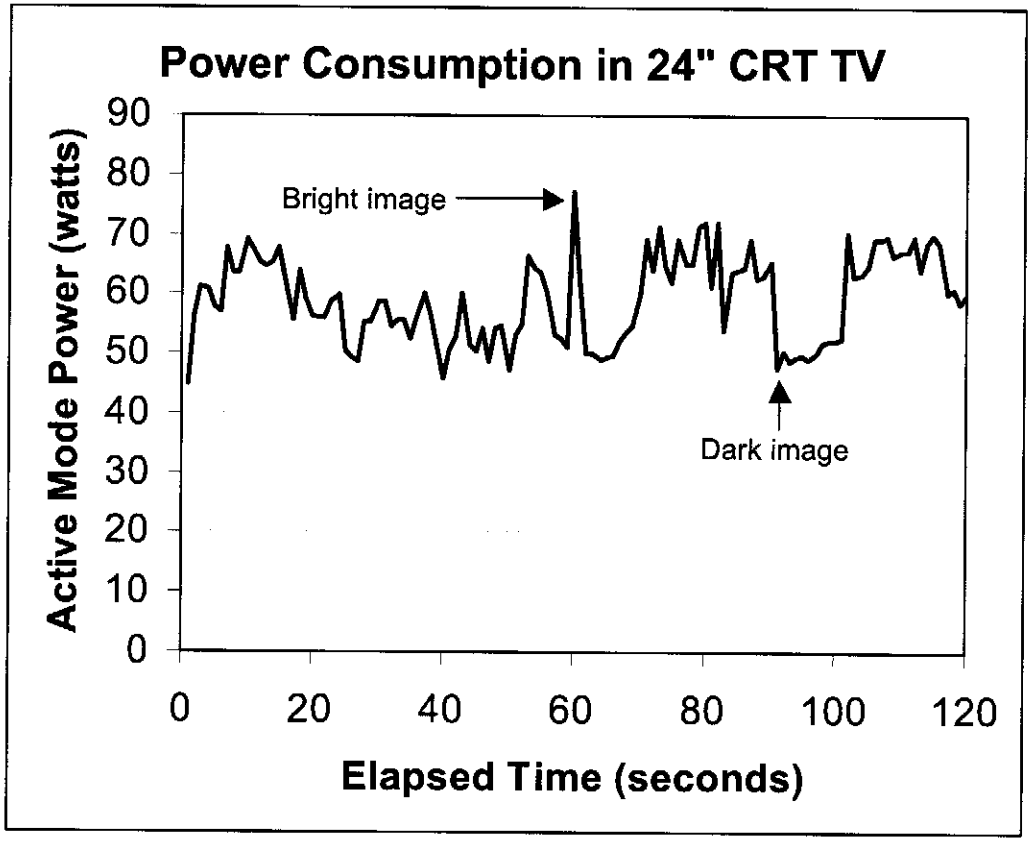
Itoh S and Tanaka M. "Current Status of Field Emission Displays." *Proceedings of the IEEE.* Vol. 90, No. 4. April 2002.

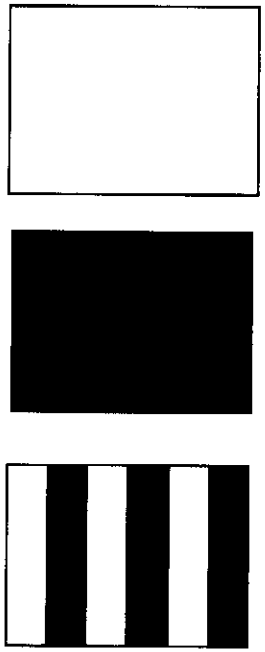

Energy Use of TVs and Home Appliances
TVs
Appliances
Annual Energy Use (kWh)
700
600
500
400
300
200
100
0
Active Mode
Standby Mode
< 30" Direct View TV
30 - 40" Direct View TV
> 40" Direct View TV
Projection TV
Washing machine
Dishwasher
Refrigerator, 22.5 cu ft.

What have we learned?

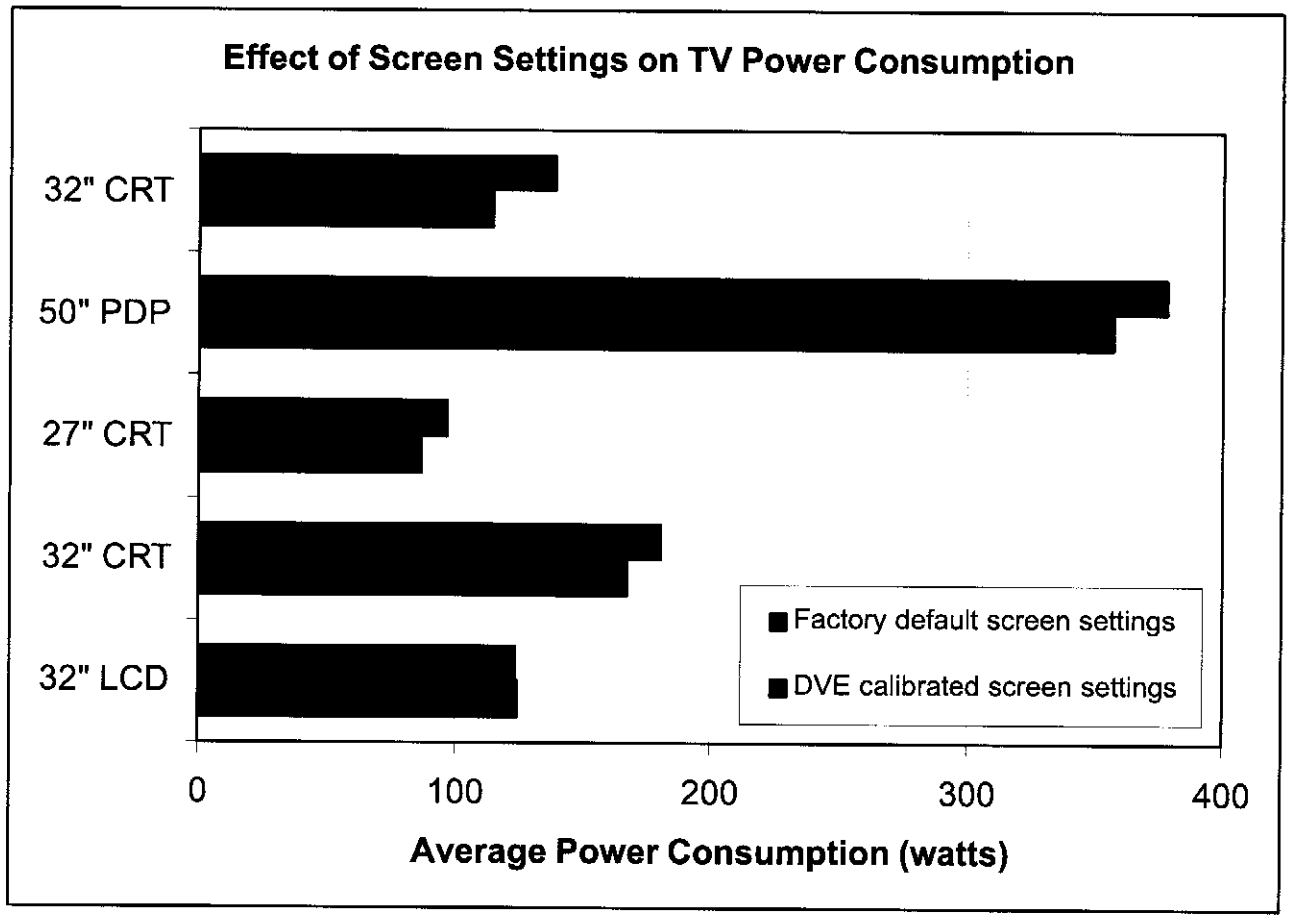
- TV models of given size can vary widely in power consumption while providing similar resolution picture even for models of the same screen technology
- Direct view display technologies follow a similar efficiency trend; no one technology *today* stands out as efficient or inefficient
- Projection display technologies follow a separate efficiency trend due to fixed power consumption of projection bulbs
- Wide spread in efficiency means opportunity to encourage most efficient models
- Demand for an active mode test method

Power use can vary significantly based on image displayed

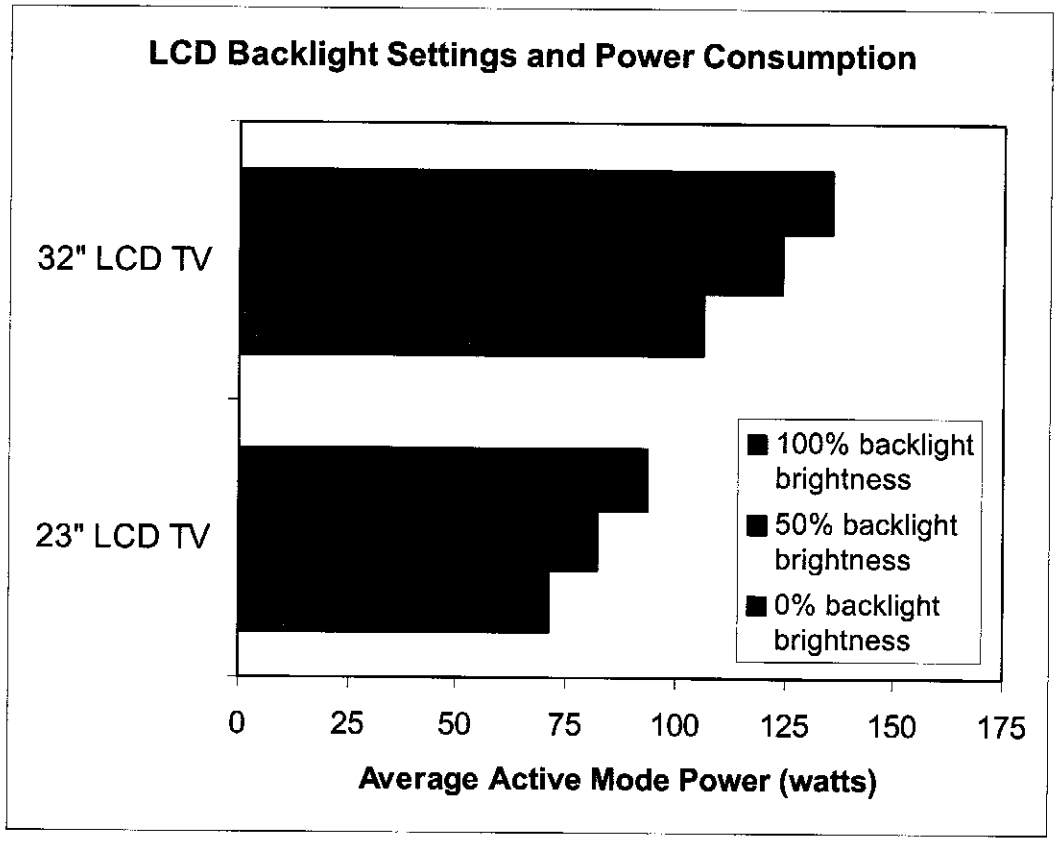




Bright showroom settings affect power consumption in many TVs

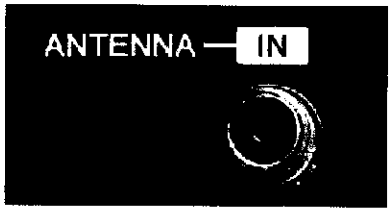


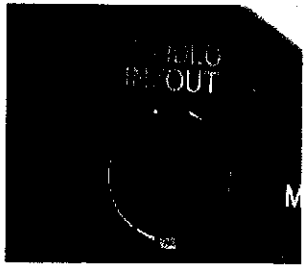
Screen settings can even affect new LCD TVs with backlight controls

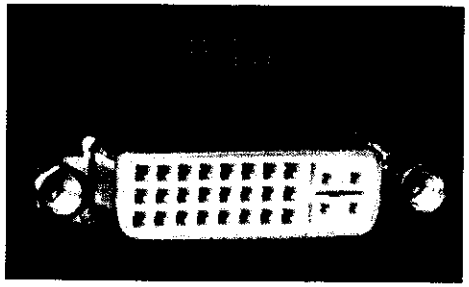


~ 14% range in power use observed

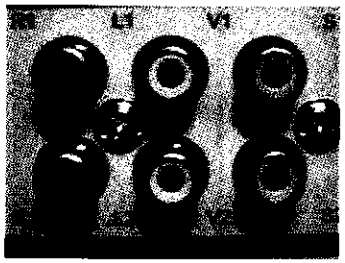
How to feed the signal?

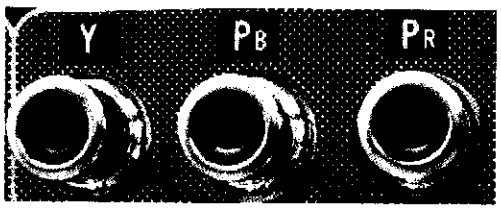


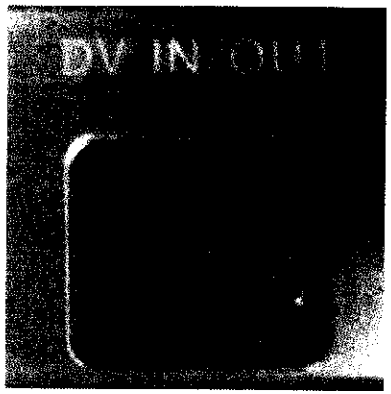




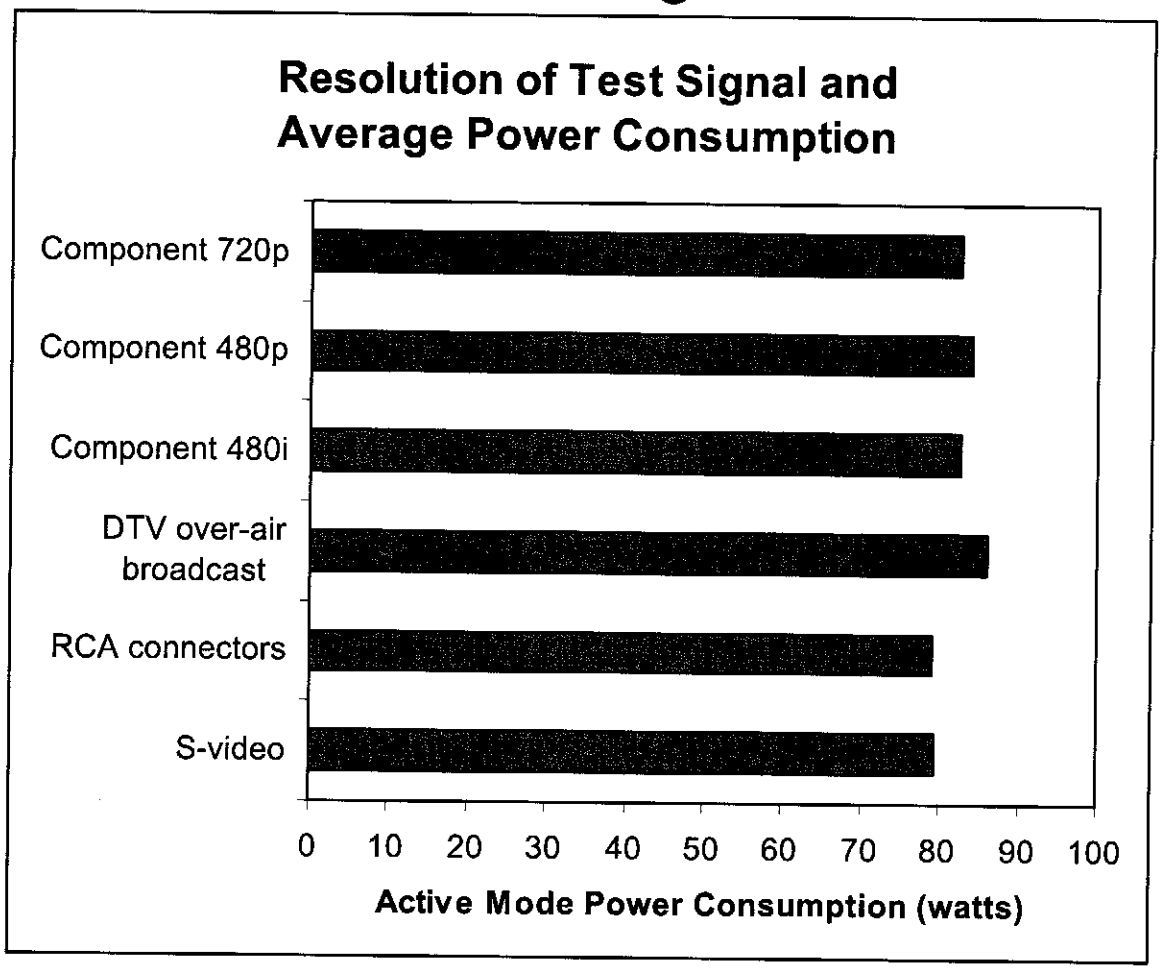
HDMI







Resolution of test signal can matter



5% - 10% increase in power consumption using digital signals

What *is* a good TV test method?

- Easy to Conduct
  - A trained technician should be able to quickly and easily perform the test
- Reproducible
  - Test setup should be clear enough that results do not vary with lab or technician
- Robust
  - Can measure all types of TVs, regardless of display technology (CRT, LCD, PDP, etc.)
  - No significant changes in test procedure would be required for future technologies
- Representative
  - Should indicate real world power consumption of TV

Questions?

Peter Ostendorp

Research Analyst

Ecos Consulting

postendorp@ecosconsulting.com

(970)259-6801 ext. 307

ecos CONSULTING

Response to ComEd's First Set of
Data Requests to NRDC
Docket No. 07-0540
Response of NRDC Witness Henry Henderson

Request No. 1.02: Please provide copies of all documents relied upon by any witness(es), including but not limited to workpapers, in preparing responsive testimony submitted on your behalf in Docket No. 07-0540 on December 14, 2007.

Response: Mr. Henderson did not prepare workpapers or rely on other documents in preparing testimony.

NRDC
Ex D

Response to ComEd's First Set of
Data Requests to NRDC
Docket No. 07-0540
Response of NRDC Witness Henry Henderson

Request No. 1.03: With respect to the Direct Testimony of Mr. Henderson on page 4, lines 71-74 stating that "[o]ther jurisdictions have had good program penetration and success with residential new construction programs that offer designers and builders design assistance and incentives for building homes that achieve energy savings above a certain threshold level," please identify these "[o]ther jurisdictions" explain the basis for, and provide any supporting studies, analyses and data concerning, Mr. Henderson statement.

Response: Two examples of "other jurisdictions" that have had good experience with residential new construction programs are Vermont and California. Vermont has a successful residential new construction program with a high benefit-cost ratio. The benefit cost ration of its 2007 – 2008 residential new construction program is 5.55. See Efficiency Vermont Annual Plan 2007 – 2008, prepared for the Vermont Public Service Board, June 1, 2007 by the Vermont Efficiency Investment Corporation, p. 31. California is another jurisdiction that has achieved energy savings and extensive participation in its Residential New Construction program. See Evaluation, Measurement and Verification of the 2004 & 2005 California Statewide Energy Star New Homes Program, Prepared for the California Public Utilities Commission Energy Division by RLW Analytics (July 18, 2007). California has a mild climate and very stringent residential building codes, unlike Illinois, so the TRC for the California programs is much lower than what would be expected for a similar program in IL.

Response to ComEd's First Set of
Data Requests to NRDC
Docket No. 07-0540
Response of NRDC Witness Henry Henderson

Request No. 1.04: Please explain the basis for, and provide any supporting studies, analyses and data concerning, the statement on page 11, lines 242-44 of the Direct Testimony of Mr. Henderson that "the more money allocated to incentives, the more successful the program will be. In contrast, program administrative costs do not necessarily correlate with improved program performance."

Response: Energy efficiency program planners and managers have long recognized the relationship between incentive levels and participation. When program participation, or uptake of a desired end use, is lagging, a common strategy for increasing participation is increasing the incentive. In some market sectors, such as the small business sector, program participation is high (80 – 90%) if customers are not required to pay for the measure but drops to 50% if incentives are reduced and customers must pay part of the measure cost, even where the measure cost has a payback period of no more than one year. A graph that illustrates the relationship between incentives and participation for CFLs is attached based on a study performed by Nexant for NYSERDA.

Energy efficiency program planners and managers have also recognized that higher administrative costs do not translate to increased program performance, and therefore strive to keep program administrative costs low. In California, a jurisdiction with a long history of successful energy efficiency programs, regulators carefully scrutinize and even cap program administration costs. For example, for programs administered by contractors, the California Public Utilities Commission capped administration costs at 5%, and decreed that the 5% will be paid only "when circumstances warrant greater than average support or scrutiny". California Public Utilities Commission Decision 02-05-046, p. 36.

Response to ComEd's First Set of
Data Requests to NRDC
Docket No. 07-0540
Response of NRDC Witness Henry Henderson

Request No. 1.05: With respect to the recommendation "that the portfolio administrators support development of a statewide web site that contains information about energy efficiency measures, tools and resources, training, and a description of all energy efficiency programs that are available statewide" described in the Direct Testimony of Mr. Henderson, on page 4, lines 75-83, please provide all data and analyses related to and determining the cost-effectiveness of this web site.

Response: The TRC cost-effectiveness calculation is not applied to marketing and outreach activities, such as web sites, on a stand-alone basis because savings are not directly attributable to the marketing and outreach activities. Instead, savings result for the TRC cost-effectiveness calculation when measures are installed. Thus, Mr. Henderson has not analyzed the cost-effectiveness of the proposed statewide web site. However, a single web site with common information and utility-specific information is likely to be less costly than three different sites with overlapping information.

Response to Commonwealth Edison Company
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Lazare

ICC Person Responsible:	Peter Lazare
Title:	Rate Analyst, Financial Analysis Division
Business Address:	Illinois Commerce Commission
	527 East Capitol Avenue
	Springfield, IL 62701

Request No. 1.02

Please provide copies of all documents relied upon by any witness(es), including but not limited to workpapers, in preparing responsive testimony submitted on your behalf in Docket No. 07-0540 on December 14, 2007.

Response

Mr Lazare relied on the Company filing as well as the internet information referenced in his testimony.

Staff
Ex 2.0

Response to Commonwealth Edison Company
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Pearce

ICC Person Responsible: Bonita Pearce
Title: Accountant, Financial Analysis Division
Business Address: Illinois Commerce Commission
527 East Capitol Avenue
Springfield, IL 62701

Request No. 1.02

Please provide copies of all documents relied upon by any witness(es), including but not limited to workpapers, in preparing responsive testimony submitted on your behalf in Docket No. 07-0540 on December 14, 2007.

Response

Ms. Pearce relied on the petition and testimony filed by Commonwealth Edison Company in Docket No. 07-0540, as stated in her Direct Testimony, ICC Staff Exhibit 2.0, filed on e-docket December 14, 2007. She has no workpapers.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible: Richard Zuraski
Title: Senior Economist, Energy Division—Policy Program
Business Address: Illinois Commerce Commission
527 East Capitol Avenue
Springfield, IL 62701

Request No. 1.02:

Please provide copies of all documents relied upon by any witness(es), including but not limited to workpapers, in preparing responsive testimony submitted on your behalf in Docket No. 07-0540 on December 14, 2007.

Response

With respect to Mr. Zuraski's Direct Testimony:

The table on page 22 was derived by taking 3% of the following values shown in ComEd Ex. 5.3:

(H) = [(C)*1000*(G)/100]
Spend Screen Adjusted to Reflect Energy Efficiency Goals
$39,369,795
$81,597,210
$126,657,878

Some of the testimony concerning deemed savings was based on the file named "07-0540 Staff Resp to ComEd-Staff 01-02 Zuraski_Attachment 1.xlsm," attached.

Some of the testimony concerning the deemed savings as a way of reducing the company's risk is based on the filed named, "07-0540 Staff Resp to ComEd-Staff 01-02 Zuraski_Attachment 2.xlsm,"attached.

Some of the testimony concerning deemed savings was based on the CPUC, "Energy Efficiency Policy Manual," Version 2, August 2003, pp. 18-19, a copy of which is attached as "07-0540 Staff Resp to ComEd-Staff 01-02 Zuraski_Attachment 3.pdf."

All other documents relied upon were provided by the Company or DCEO in their initial filings or in response to data requests.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible:	Richard Zuraski
Title:	Senior Economist, Energy Division—Policy Program
Business Address:	Illinois Commerce Commission
	527 East Capitol Avenue
	Springfield, IL 62701

Request No. 1.03:

With respect to the statement on Page 6, lines 159-60 of the Direct Testimony of Mr. Zuraski that "Mr. Fiepel does not appear do (sic) describe similar efforts to implement new ***appliance*** standards (which are also mentioned in Section 12-103(f)(2))," is Staff aware of any "new appliance standards"? If so, please identify such standards.

Response

As noted in Mr. Zuraski's testimony, he does not know how ***new*** a standard has to be to be considered "new."

Notwithstanding this ambiguity in the term new, Mr. Zuraski is aware that the Federal Government has adopted appliance standards.

For example, Mr. Zuraski notes the following information from the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) website:

> Minimum standards of energy efficiency for many major appliances were established by the U.S. Congress in Part B of Title III of the Energy Policy and Conservation Act (EPCA), Public Law 94-163, as amended by the National Energy Conservation Policy Act, Public Law 95-619, by the National Appliance Energy Conservation Act, Public Law 100-12, by the National Appliance Energy Conservation Amendments of 1988, Public Law 100-357, and by the Energy Policy Act of 1992, Public Law 102-486, and by the Energy Policy of 2005, Public Law 109-58. (PDF 90 KB) Download Adobe Reader
>
> To access these laws establishing federal appliance and equipment standards and DOE's authority to review, revise, and issue standards, see the United States Code, Title 42, Chapter 77, Subchapter III, Part A—Energy Conservation Program for Consumer Products Other Than Automobiles and Part A-1—Certain Industrial Equipment.
>
> Regulations are issued by executive branch agencies to carry out federal laws, such as the standards laws, and are available in the Code of Federal Regulations. For the regulations pertaining to appliance and equipment standards, see Title 10, Chapter II, Part 430—Energy Conservation Program for

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible: Richard Zuraski
Title: Senior Economist, Energy Division—Policy Program
Business Address: Illinois Commerce Commission
527 East Capitol Avenue
Springfield, IL 62701

Consumer Products and Title 10, Chapter II, Part 431—Energy Efficiency Program for Certain Commercial and Industrial Equipment.

Proposed and recently adopted rules and regulations may be found in the Federal Register and on the relevant product pages on this site.

http://www.eere.energy.gov/buildings/appliance_standards/laws_regs.html

The following site lists other information about the U.S. Department of Energy's Appliances and Commercial Equipment Standards Program : **http://www.eere.energy.gov/buildings/appliance_standards/**

More specifically, the following is a citation to a "new" federal rule concerning Residential Furnaces and Boilers:

See 65136 Federal Register / Vol. 72, No. 222 / Monday, November 19, 2007 / Rules and Regulations

DEPARTMENT OF ENERGY 10 CFR Part 430

[Docket Number: EE–RM/STD–01–350] RIN 1904–AA78 Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers

AGENCY: Department of Energy. **ACTION:** Final rule.

SUMMARY: The Department of Energy (DOE) has determined that revised energy conservation standards for residential furnaces and boilers will result in significant conservation of energy, are technologically feasible, and are economically justified. On this basis, DOE is today amending the existing energy conservation standards for these products.

DATES: The rule is effective January 18, 2008. The standards established in today's final rule have a compliance date of November 19, 2015.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible: Richard Zuraski
Title: Senior Economist, Energy Division—Policy Program
Business Address: Illinois Commerce Commission
527 East Capitol Avenue
Springfield, IL 62701

The following is a citation to an older (but possibly still "new") federal rule concerning "Certain Consumer Products and Commercial and Industrial Equipment," including, among other things, the following "appliances":

- Ceiling fans and ceiling fan light kits manufactured on or after January 1, 2007.
- Dehumidifiers manufactured on or after October 1, 2007

Federal Register / Vol. 70, No. 200 / Tuesday, October 18, 2005 / Rules and Regulations **60407**

DEPARTMENT OF ENERGY
Office of Energy Efficiency and Renewable Energy

10 CFR Parts 430 and 431
RIN 1904–AB54

Energy Conservation Standards for Certain Consumer Products and Commercial and Industrial Equipment
AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.
ACTION: Final rule; technical amendment.
SUMMARY: The Department of Energy (DOE) is publishing this technical amendment to place in the Code of Federal Regulations the energy conservation standards, and related definitions, that Congress prescribed in the Energy Policy Act of 2005 for certain consumer products and commercial and industrial equipment.

DATES: *Effective Date:* October 18, 2005.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible:	Richard Zuraski
Title:	Senior Economist, Energy Division—Policy Program
Business Address:	Illinois Commerce Commission 527 East Capitol Avenue Springfield, IL 62701

Request No. 1.04:

Please explain in more detail, and provide the basis for, including any supporting studies, analyses and data, the statement that "if projected savings are ***not*** annualized, then strictly meeting the savings goal in the year of implementation would lead to exceeding the goal in any ***full*** twelve-month period over the life of the measure" on page 15, lines 348-50 of the Direct Testimony of Mr. Zuraski.

Response

First, as noted in the answer beginning on line 355 of the Direct Testimony of Mr. Zuraski, the proposal to annualize savings involves certain legal issues that were not addressed by Mr. Zuraski in his testimony. Request No. 1.04 indirectly raises some of those legal issues, and Staff objects to Request No. 1.04 to the extent it seeks a legal opinion. Subject to and without waiving this objection, Staff responds as follows:

As an explanation, consider the following example. Assume the expected useful life of an efficiency measure is 12 months. If the measure is installed on June 1, 2008, then the savings accrue for the 12 month period, June 1, 2008 through May 31, 2009. If the same measure is installed on April 1, 2009, then the savings accrue for the 12-month period, April 1, 2009 through March 31, 2010. Under the Company's proposed annualized savings accounting, each of these installations would contribute the same amount of energy toward meeting the savings goals for that year. However, without annualizing energy savings, the former installation would most likely contribute greater energy savings than the latter, since the latter's savings would only be permitted to contribute toward the goal from April 1, 2009 through May 31, 2009. Physically, energy savings would continue to accrue for another 10 months. Thus, if, without annualization and despite some measures being installed after June 1, the allowed savings still enabled the company to meet the goal for June 1, 2008 through May 31, 2009, then the continued accrual of savings beyond May 31, 2009 could be viewed as exceeding the goal by providing additional savings that are not being counted. Although this example assumed a measure with a 12-month useful life, the same type of comparison of annualized to non-annualized savings would exist for measures with longer useful lives.

The cited statement and the above explanation are based on the assumptions that:

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible: Richard Zuraski
Title: Senior Economist, Energy Division—Policy Program
Business Address: Illinois Commerce Commission
527 East Capitol Avenue
Springfield, IL 62701

1) The company (or DCEO) would not be causing energy efficiency measures to be installed all on June 1, but rather throughout the implementation year (June 1 through May 31).

2) During the period June 1 through May 31, the energy savings generated from measures installed after June 1 would be less than those installed on June 1. This is not necessarily true of all measures. For example, a measure that only reduces the amount of energy used for winter heating should have the same effect during the period June 1, 2008 through May 31, 2009, if it is installed on June 1, 2008 or September 1, 2008 (but not if it is installed on March 1, 2009). However, it would be true of measures that are not weather-sensitive (such as lighting) or that are associated with summer cooling.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible: Richard Zuraski
Title: Senior Economist, Energy Division—Policy Program
Business Address: Illinois Commerce Commission
527 East Capitol Avenue
Springfield, IL 62701

Request No. 1.05:

With respect to the Direct Testimony of Mr. Zuraski on page 15, lines 348-50, please identify any states where utilities do not annualize energy savings estimates in their reporting to regulatory agencies and provide any related documentation.

Response

Staff objects to Data Request No. 1.05 on multiple grounds. First, the request is unduly vague. The instant proceeding, and the discussion of annualizing energy savings, concerns Illinois statutory requirements to achieve certain energy efficiency and demand response goals. The request fails to identify, describe or define the "reporting to regulatory agencies" in other states that is the subject of the request. Second, to the extent that the request refers to legal reporting requirements in other states, Staff objects to the extent it calls for a legal opinion. Third, Staff objects to Data Request No. 1.05 because it assumes that there are states that annualize energy savings, a fact not in evidence. Fourth, Staff objects to Data Request No. 1.05 to the extent it assumes or implies that Mr. Zuraski's Direct Testimony (at lines 348-50 or elsewhere) depends or relies on other states annualizing or not annualizing energy savings in whatever reporting to regulatory agencies occurs in those states. Neither the cited portion of Mr. Zuraski's testimony, nor anything else in his testimony, (i) asserts that other states do or do not annualize energy savings or (ii) relies, either explicitly or implicitly, upon other states' positions on annualizing.

Subject to and without waiving the foregoing objections, Staff responds as follows:

Mr. Zuraski has not investigated and does not know whether other states have required utilities to achieve specific levels of energy efficiency and demand response savings, whether there are any related reporting requirements imposed on utilities in other states, or whether annualizing energy savings is permitted or prohibited in connection with any savings or reporting requirements imposed on utilities in other states.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible:	Richard Zuraski
Title:	Senior Economist, Energy Division—Policy Program
Business Address:	Illinois Commerce Commission 527 East Capitol Avenue Springfield, IL 62701

Request No. 1.06:

With respect to the statement on page 17, lines 393-94 of Mr. Zuraski's Direct Testimony that "the alternative can be another relatively modest attempt at estimation," does Staff have any recommended alternatives to ComEd's proposal to annualize savings? If so, please explain.

Response

No.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible:	Richard Zuraski
Title:	Senior Economist, Energy Division—Policy Program
Business Address:	Illinois Commerce Commission 527 East Capitol Avenue Springfield, IL 62701

Request No. 1.07:

With respect to the statement on page 33, lines 777-78 of the Direct Testimony of Mr. Zuraski regarding "various concerns . . . about potential inaccuracies in Tables 6, 7 and 8" of the Direct Testimony of Val Jensen (ComEd Ex. 6.0), please identify those concerns that remain after ComEd's Response to Staff's Data Request No. ED 2.05.

Response

With respect to Table 7, Mr. Zuraski has not yet performed a thorough review of the methods used to derive the values. With respect to Table 8, as indicated in the testimony, Mr. Zuraski remains suspicious of the basis for the 0.8 NTG ratio.

Response to Commonwealth Edison Company's
First Set of Data Requests to Staff
Docket No. 07-0540
Response of Staff Witness Zuraski

ICC Person Responsible: Richard Zuraski
Title: Senior Economist, Energy Division—Policy Program
Business Address: Illinois Commerce Commission
527 East Capitol Avenue
Springfield, IL 62701

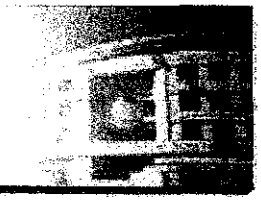
Request No. 1.08

With respect to the statement on page 44, lines 914-15 of Mr. Zuraski's Direct Testimony that "getting the numbers ***right*** is more important than getting them right away," does Staff have any recommended alternatives to ComEd's proposed deemed measure savings and net-to-gross ratio values? If so, please explain.

Response

Mr. Zuraski is not proposing alternative methods or values in this docket. As explained in the testimony, Mr. Zuraski recommends against deeming in this, or any other, planning docket.

CALIFORNIA PUBLIC UTILITIES COMMISSION



ENERGY EFFICIENCY POLICY MANUAL VERSION 2

Prepared by the Energy Division

August 2003

Table of Contents

Introduction

This document contains the California Public Utilities Commission's (Commission) policy rules in the development and evaluation of energy efficiency programs in California. The policy rules in this document guide applicants proposing energy efficiency programs to the Commission in designing program proposals, applying for funding, and implementing their programs.

This document, referred to as the Policy Manual (manual), shall apply to all programs commencing subsequent to the date of the adoption of this document by the Commission. This manual applies to energy efficiency programs funded through the following mechanisms:

- The electric public goods charge (PGC), as authorized by Public Utilities (PU) Code Sections 381 and 399[1]
- The gas PGC, as authorized by PU Code Sections 890-900.

The rules in this manual do **not** currently apply to:

- Low-income energy efficiency programs funded by the electric or gas PGC
- California Alternative Rates for Energy (CARE) for low-income customers funded out of electric or gas PGC[2]
- Interruptible rate or load management programs[3]
- Self-generation and demand-responsiveness programs developed in response to AB970 (PU Code Section 399.15(b)).[4]

This manual contains the most recent adopted Commission policy rules relating to energy efficiency as of this writing and is the revised version of the manual adopted in Decision (D.) 01-11-066. This manual replaces the "Adopted Policy Rules for Energy Efficiency Activities" adopted in Commission Resolution E-3592 and modified in subsequent decisions including D.00-07-017 and D.01-01-060. Those policy rules, initially recommended by the California Board for Energy Efficiency and adopted in Commission Resolution E-3592, are no longer in effect and are superceded by this manual and its subsequent editions.

---

[1] Consistent with the provisions of AB117 (Chapter 838, Chaptered September 24, 2002), Section 381.1 was added to Public Utilities Code permitting community choice aggregators (CCAs) to apply to administer cost-effective energy efficiency and conservation programs. The Commission adopted certain procedures in Decision (D.) 03-07-034 (dated July 10, 2003) to implement portions of AB 117 affecting the allocation of energy efficiency program funds.

[2] A separate low-income rulemaking was initiated on August 23, 2001 (R.01-08-027).

[3] Interruptible and load management programs are primarily being addressed in Rulemaking (R.) 00-10-002.

[4] These programs were adopted in D.01-03-073, in R.98-07-037.

In addition, Appendix A details other materials and supporting documents that are incorporated into this policy manual by reference, and may include additional information on the application of these rules. Appendix B contains common terms on energy efficiency; Appendix C provides definitions in alphabetical order.

Finally, the rules contained in this manual do not apply to pre-1998 program commitments by the Investor-Owned Utilities (IOUs), which are to be funded using pre-1998 carryover funds, or to any shareholder incentives associated with those commitments, both of which remain subject to the demand-side management (DSM) policy rules that were in place at the time those commitments were made.[5]

This document is organized into the following sections:

1. Policy Objectives
2. Program Design Requirements and Eligibility Guidelines
3. Funding for Community Choice Aggregators (CCAs)
4. Cost-Effectiveness
5. Budgets and Compensation
6. Evaluation, Measurement, and Verification Requirements
7. Process and Procedural Issues

The Commission, or the Energy Efficiency Assigned Commissioner, Assigned Administrative Law Judge (ALJ), or the Energy Division may update this manual, in whole or in part, at any time. In addition, we may update or modify any supporting documents incorporated into these rules by reference, separately or alongside modifications made to this document.

[5] See, for example, *Protocols and Procedures for the Verification of Costs, Benefits, and Shareholder Earnings from Demand-Side Management Programs,* in D.93-05-063, revised March 1998.

1. Policy Objectives

The Commission will select programs that are cost effective, achieve maximum energy and peak demand savings, provide access to energy efficiency alternatives to underserved or hard-to-reach, have the ability to overcome market barriers and take advantage of coordination with existing programs. When evaluating program proposals, the Commission will determine how well each utility or non-utility program proposal meets these objectives. These objectives are considered primary criteria in ranking proposals. The Commission will use the point values listed below for each criterion.

Primary Criteria For: PGC "Hardware" and Incentive Programs

(1) Cost-Effectiveness (30 points for program net benefits, 10 points for benefit-cost ratio) 40 Points

All proposals for energy efficiency programs will be required to provide an estimate of life-cycle benefits and cost from various points of view, using the assumptions detailed in Chapter 4. The Commission will use this information to compare and rank program proposals designed for similar uses, markets, or customer segments.

(2) Long-term Annual Energy Savings 20 Points

An important goal of any Commission energy efficiency program is to create permanent and verifiable energy savings over the life cycle of the relevant energy efficiency. Programs are not required to create immediate short-term energy savings, so long as there is a clear, logical, and verifiable link between program activities and eventual energy savings. In other words, the Commission will strive for sustainability in the consumption behaviors and investment choices its programs are designed to stimulate. In general, long-term energy savings are those that continue over at least a three-year period.

(3) Electric Peak Demand Savings 15 Points

Programs paid for by electric (PGC funds should emphasize long-term and permanent peak demand savings. Such programs may include, for example, installation of permanent measures to reduce peak demand, such as variable-speed drives on motors, but should not include programs that create peak demand savings only through temporary behavioral change, such as air conditioner cycling or programs that encourage consumers to turn off lighting or air conditioning.

(4) Equity 10 Points

The Commission will generally prioritize programs that provide access to energy efficiency alternatives for underserved or hard-to-reach markets. Although those customers contribute equally to the funds collected to support program activities, in the past, they have had access to fewer program alternatives than other customers. The Glossary (Appendix C to this manual) provides a more detailed definition of underserved and hard-to-reach markets, either from the point of view of customer class (*e.g.*, multifamily building residents, small businesses) or geography (*e.g.*, rural customers).

(5) Ability to Overcome Market Barriers **5 Points**

Any program proposed for Commission approval should include a description of the type of barrier it is designed to address or overcome. The following examples of barriers are listed in order of importance; programs may also address other barriers not listed below:

- Higher start-up expense for high-efficiency measures relative to standard-efficiency measures
- Lack of consumer information about energy efficiency benefits
- Lack of financing for energy efficiency improvements
- Split incentives (between owners/landlords and tenants)
- Lack of a viable and competitive set of providers of energy efficiency services in the market
- Barriers to the entry of new energy efficiency service providers
- Lack of availability of high-efficiency products

(6) Innovation **5 Points**

The Commission will prioritize programs that present new ideas, new delivery mechanisms, new providers or energy efficiency services, or new and emerging technologies to address new program areas, to overcome existing shortcomings, or to improve the effectiveness of existing programs.

(7) Coordination With Programs Run by Other Entities **5 Points**

To minimize confusion and overlap for consumers, the Commission desires program proposals that take advantage of coordination with other existing programs, including those run by other state agencies, private entities, municipal utilities, or the federal government.

Primary Criteria For: Information-Only and Statewide Marketing and Outreach Programs

The Commission will support information-only programs that provide customers with general information on energy efficiency and conservation opportunities. Some information programs may provide training and educate industry participants; others may promote efficient motors or improving industrial processes. Some of the industry participants include lodging, convenience stores, contractors/subcontractors, schools, manufacturers, builders or inspectors.

For statewide marketing and outreach, the Commission will select programs that convey consistent statewide messages to individual consumers through mass-market advertising campaign. The statewide messages should (1) be on simple things individual consumers can do to reduce their bills and risk of rolling blackouts and /or to increase consumer awareness and participation in energy efficiency programs available to them throughout the state; (2) focus on energy efficiency rather than conservation; and (3) persuade consumers to make permanent changes to their homes and businesses so that energy savings are not dependent on temporary or impermanent behavioral change.

Information-only and statewide marketing and outreach programs will be evaluated using criteria most relevant to these programs; thus, cost-effectiveness or demonstration that programs will reduce peak demand will not be required. These programs will be evaluated using the following criteria:

(1) Ability to Overcome Market Barriers	**25 Points**
(2) Equity	**25 Points**
(3) Innovation	**25 Points**
(4) Coordination with other Program Implementers	**25 Points**

In addition, the Commission will consider the following secondary criteria and use the point values for each criterion.

Secondary Criteria For: PGC "Hardware/Incentive and Information-Only/Statewide Marketing and Outreach Programs

(1) Quality and viability of program design	**30 Points**
(2) Distribution and reasonableness of budget	**20 Points**
(3) Program objectives and tasks clearly identified	**20 Points**
(4) Experience with successful delivery of similar programs	**20 Points**
(5) Alleviates transmission constraints in an area identified by California Independent System Operator	**10 Points**

Although not a selection criteria, in order to execute the contract, parties who implement energy efficiency programs must demonstrate that they will comply with all local, state, and federal laws, and that they have or will obtain all necessary licenses.

Commission staff will review proposals and recommend the design of the porfolio as follows: (1) Staff will evaluate each qualifying proposal using the primary and secondary criteria as set forth above; (2) The proposals will be ranked in order of their scores on the primary criteria to create a short list of highest ranking proposals; (3) The proposals in this short list will then be ranked based on their combined primary and secondary criteria scores; and (4) Finally, a portfolio of programs will be assembled from this smaller pool of proposals. Staff will go through the ranked list of proposals from top to bottom and will consider each proposal's fit into the portfolio. The portfolio must adhere to available funding by utility territory and have a total resource cost (TRC) ratio greater than one. Staff will compile a portfolio of programs that balances the following goals:

- Maximized energy savings
- Strong cost-effectiveness
- Equitable geographic distribution
- Diversity of target markets
- Equity by rate class
- Equity between gas and electric program offerings and energy savings
- Diversity of program offerings
- Multiple languages offered to program participants

Staff will provide its recommended portfolio of programs to the Commission. The Commission will make the final determination on the programs that will qualify for funding.

2. Program Design Requirements and Eligibility Guidelines

Energy efficiency activities encompassed by this document are those that require permanent replacement of energy-using equipment with more efficient models. Only those activities that fall within this definition or support the ultimate goal (such as related information or education activities), will be considered for PGC funding.

Types of Activities Ineligible for PGC Funding

- Cogeneration programs or projects
- Load-shifting programs that rely **only** on temporary or impermanent behavioral change (programs that install *permanent* equipment to manage load, such as energy management systems, are eligible)
- Distributed or self-generation
- Technology research and development
- Fuel switching

The above programs are excluded from funding to ensure maximum funding availability for energy efficiency programs, since other funding sources exist for the listed activities.

Types of Programs Eligible for PGC Funding[6]

1. Statewide Programs
2. Local Programs
3. Statewide Marketing and Outreach
4. Market Assessment and Evaluation Activities

For each program cycle, the Commission may adopt different mix of programs depending on the types of programs proposed, how programs meet adopted criteria, and the potential for energy savings in relevant markets.

To assure the state receives the benefit of the best and most cost-effective package of energy efficiency programs, any party may propose any type of energy efficiency program for funding. Additionally, all programs selected for PGC funding will be considered on a program-by-program basis. Thus, if an applicant proposes more than one program as part of a portfolio, each program will be chosen individually on a case-

[6] Detailed program descriptions are contained in D.01-11-066 and D.03-08-067.

by-case basis. It is because each program generally has a unique combination of objectives, target market or market segment, marketing approach, energy efficiency measures included, strategy for addressing a market failure, and plan for evaluation and savings measurement and verification.

Required Program Elements

All programs considered for selection by the Commission will be required to include the following general elements:

- A defined market segment the proposed program serves (from the market segments listed in Appendix B)
- Program concept and rationale that includes objectives and a summary of the barrier(s) the program is designed to address
- A delivery strategy (list and choose from among the strategies listed in Appendix B)
- A description of the program process including implementation plan, eligible program participants, processes for equipment purchase and installation
- A defined set of energy efficiency measures or technologies included in the program and associated per-unit energy savings data and cost effectiveness inputs (if applicable).
- A marketing and outreach plan
- A program budget (using the workbook template provided by Energy Division)
- Cost-effectiveness calculations (using the workbook template provided by Energy Division)
- A set of indicators or benchmarks to be used to determine to what extent the program has been successful
- An evaluation and/or measurement and verification plan and recommended independent evaluation consultants
- A description of program implementers qualifications
- A work plan that includes proposed program staffing and timeline

Double-dipping

Finally, programs should be designed to eliminate potential double dipping by program participants into more than one ratepayer- or taxpayer-funded public purpose program. The risk of abuse can be minimized through careful participant tracking and coordination among programs. Customers accepting financial incentives through any program approved by the Commission should be required to acknowledge the source of funds by signing an affidavit or other paperwork declaring that they have received no funds for the same activity from another program or source.

3. Funding for Community Choice Aggregators (CCAs)[7]

Guidelines for Funding Application

Any party that has been established by local authorities as a CCA pursuant to California Public Code Section 331.1 may apply for energy efficiency funding subject to the guidelines, criteria, schedules and EM&V that apply to third parties, as set forth in this Policy Manual and Commission rulings and orders. The CCA need not have Commission authority to aggregate electrical load or purchase energy on behalf of its customers in order to apply for energy efficiency program funding pursuant to Section 381.1.

In determining whether to approve an application to become an administrator, the Commission will consider the value of program continuity and planning certainty and the value of allowing competitive opportunities for potentially new administrators. The Commission will weigh the benefits of each party's proposed program to ensure that the program meets the following objectives:

(1) Is consistent with the goals of the existing programs established pursuant to Section 381.
(2) Advances the public interest in maximizing cost-effective electricity savings and related benefits.
(3) Accommodates the need for broader statewide or regional programs.

The Commission may adjust the share of energy efficiency program activities directed to a CCA's territory to promote equity and cost-effectiveness. The Commission will maintain energy efficiency programs targeted to specific locations where needed to avoid or defer transmission or distribution system upgrades irrespective of whether the loads in that location are served by the CCA or an electrical corporation. The Commission may require program administrators to share information on program impacts with the CCA and to accommodate any unique community program needs by shifting emphasis of approved programs, provided that the shift in emphasis does not impact the effectiveness of overall statewide or regional programs.

For purposes of AB 117, CCAs may apply for energy efficiency program funding consistent with the timing of Commission authorized solicitations for energy efficiency proposals.

[7] Commission D.03-07-034 adopted modifications to the energy efficiency manual to include provisions for CCAs.

CCA Applications for Program Funding Extensions and Renewals

A CCA with program funding may apply to extend programs by submitting program implementation plan revisions to the Commission. The revised program implementation plans may propose existing or new programs. The program implementation plan revisions should consider evaluation, measurement and verification (EM&V) results from the previous term, if available or if required by the Commission. If the EM&V results are not final, CCAs should submit initial results.

The Commission may accept all, part, or none of the CCA's proposed programs. The Commission may condition additional funds on program changes. The CCA should be prepared to provide additional information on proposed changes.

Allocating the Proportional Share of Program Activities

In cases where a CCA is established but does not administer energy efficiency programs pursuant to Section 381, the jurisdictional utility shall propose how to allocate the proportional share of funding to that CCA's territory. The utility serving the CCA's territory shall submit its estimate of the proportional share for review of the estimate's accuracy and reasonableness. That estimate should be made available to the CCA upon request and to entities considering whether to create a CCA.

Consistent with Section 381.1, the Commission may adjust the proportional share allocated to a CCA's territory as follows:

(a) To the extent that energy efficiency and conservation programs are targeted to specific locations to avoid or deter transmission or distribution system upgrades, the targeted expenditures shall continue and
(b) To accommodate any unique community program needs by placing more, or less, emphasis on particular approved programs to the extent that these special shifts in emphasis in no way diminish the effectiveness of broader statewide or regional programs.
(c) To ensure an equitable and cost-effective allocation of energy efficiency program activities.

Non-CCA Administrator Roles and Obligations

Any party may propose programs for all or part of a CCA's territory whether or not the CCA proposes energy efficiency programs for its customers.

Non-CCA administrators must coordinate with each other and the CCA to ensure that, to provide advance information where appropriate about the likely impacts of energy efficiency programs and to assure that CCAs are aware of existing programs for purposes of planning and avoiding duplication of program efforts.

Non-CCA administrators must provide implementation plans and impact forecasts to any party requesting those documents.

Utility Data

Utilities are responsible to develop information that will assist cities, counties and CCAs in resource planning and determining whether to apply for Section 381 funding. Each utility shall provide an estimate of the proportional share as described herein for a CCA's territory or proposed territory. It shall provide all types of information required by the Commission in its most recent order addressing CCA information and shall work with CCAs, cities and counties to develop data resources and information that is relevant to CCA resource planning and program implementation

4. Cost-Effectiveness

Though not every program selected will necessarily be cost-effective given the variety of policy objectives being pursued, the Commission will select a cost-effective portfolio of programs.

Measuring the cost-effectiveness of energy efficiency programs serves several purposes:

- To assist in determining whether a program is warranted (prospectively or on a continuing basis);
- To assist in determining prospectively what program activities are appropriate;
- To assist in understanding motivations for program participation by customers and service providers to customers;
- To assist in determining funding allocations for various programs;
- To assist in modifying programs during operation to increase their effectiveness;
- To assist in assessing retroactively to what extent programs have been successful in achieving the Commission's policy objectives.

Methodology

Cost-effectiveness is an important measure of value and performance. In order to ensure a level playing field for multiple programs, the Commission will continue to use the standard cost-effectiveness methodologies articulated in the California Standard Practices Manual (SPM): Economic Analysis of Demand-Side Management Programs. See Appendix A of this manual for information on how to obtain a copy of the SPM.

Two cost-effectiveness tests identified in the SPM are particularly important to the Commission in evaluating energy efficiency programs on an ongoing basis. The first is the Total Resource Cost (TRC) test - Societal Version. This test, as defined in the SPM, is intended to measure the overall cost-effectiveness of energy efficiency programs from a societal perspective, taking into account benefits and costs from more than just an individual perspective. The Commission will primarily rely upon the results of this test in assessing program cost-effectiveness.

The TRC should be calculated by treating programs as multi-year (rather than single-year) activities so that programs explicitly designed as integrated, multi-year strategies, which may have modest benefits (and/or high start-up costs) in early program years, could be evaluated considering the expected larger benefits (and/or lower costs) in later program years.

The Commission will not rely on the TRC exclusively in making funding allocation decisions among programs, but instead will use cost-effectiveness as one criterion among many (as summarized in Chapter 1 above).

In addition to the TRC test, the Commission will rely on the Participant Test (also identified in the SPM) to evaluate programs that are aimed at inducing individual customers to make energy efficiency decisions. The Participant Test measures the cost-effectiveness of a program from the perspective of energy consumers participating in the program. Proposals for programs designed to provide financial incentives directly to customers should include the results of the Participant Test as well as the TRC.

In addition to the SPM, parties proposing programs should refer to the workbook template provided by the Energy Division.

Established Cost-Effectiveness Inputs

Certain inputs to the cost-effectiveness tests identified in the SPM have already been established by the Commission. Parties should use these inputs presenting their cost-effectiveness analysis to the Commission in their program proposals. These established inputs, along with their sources, are given below. All of the values given below represent the best-available data at the time of adoption of this manual. The Commission will update these assumptions periodically.

Effective Useful Lives of Energy Efficiency Measures
Standard values for effective useful lives (EULs) or measures are the standard assumptions used to determine the life-cycle savings associated with certain common energy efficiency measures. The EUL is generally an estimate of the median number of years that the measures installed under a given program are still in place and operable.[8] If a program proposal involves any of the measures listed below, the standard assumption should be used. If a proposed program involves a measure not listed below, the applicant should propose an appropriate assumption for the EUL, citing any relevant studies or other data sources. In order to minimize uncertainty, EULs will be limited to a maximum of 20 years, even if particular devices may be expected to survive longer.

[8] Source: *Procedures for the Verification of Costs, Benefits, and Shareholder Earnings from Demand Side Management (DSM) Programs (MA&E Protocols).* See also p. 26 of September 25, 2000 CALMAC report prepared pursuant to Ordering Paragraph 9 of D.00-07-017.

Table 4.1. Effective Useful Lives of Energy Efficiency Measures

Measure	Lifetime	Measure	Lifetime
Lighting		**HVAC**	
Ballast - Dimmable	16	Air Conditioners - High Efficiency	15
Ballast - Electronic	16	Boiler - High Efficiency	20
CF- Screw-in Replaceable Lamp (Modular)	8	Bypass/Delay Timer	15
Compact Fluorescent Hardware Fixture	16	Chiller - High Efficiency	20
Delamping/Fixture Modifications/Removal	16	Chiller - Variable Speed Drive	20
Exit Sign - CF Hardware Kid/LED/ Electro-Luminescent	16	Cooling Towers/Evaporative Condenser	15
Fluorescent Fixture - T8	16	Furnace - High Efficiency	20
Halogen Lamp	0.6	Glazing - High Shade Coefficient	20
HID Fixture	16	Heat Pump - Packaged	20
Occupancy Sensor	8	HVAC/Space Heating/ Efficiency (Gas)	15
Photocell	8	Insulation	20
T8 Fixtures - 17 Watt Lamp, 2ft or 32-watt Lamp, 4ft	16	Reflective Window Film/ Windows	10
Time Clock - Lighting	8	Set-Back Thermostat	11
Fixture: T8 Lamp & Electronic Ballast	16	Time clock	10
High Efficiency Lighting	16	Heat Pump - Split System	20
High Output T5 Fixture	16	AC Packaged Terminal Units	15
Induction Lamps	2	Adjustable Speed Drive	15
Induction Fixture	16	Ground Source Heat Pump	15
Indoor or Outdoor System Modification	16	Heat Pump with Integrated Water Heating	20
Lighting Controls	16	Packaged HVAC Systems	15
Daylighting Controls	16	Water Cooled Chillers	20
Lighting Power Density	16	Insulation Package	20
Refrigeration		Energy Management System	15
Auto Closer for Cooler/Freezer	8	Reduce Internal Load	15
Door Gaskets	4	Evaporative Coolers	15
Floating Head Pressure	16	HVAC/Refrigeration - SPC	20
Heatless Door	16	Nonresidential Gas - AC	20
Humidistat Control for Anti-Sweat Heater	12	**Hot Water**	
Insulation on Refrigeration Suction Line	11	Water Heater - Gas	15
Night Covers for Display Cases	5	Horizontal Clothes Washer	10

Table 4.1 (continued). Effective Useful Lives of Energy Efficiency Measures

Measure	Lifetime	Measure	Lifetime
PSC Evaporator Motor – Walk-in/Display	16	Efficient Dishwashing	5
Refrigeration Case Doors – Glass/Acrylic	12	Water Heater Controls	15
Refrigerator Case with Doors	16	Domestic Hot Water Boiler	20
Refrigerator Condensate Evaporator – Elec/Non Elec	8	**Miscellaneous**	
Strip Curtains for Walk-Ins	4	Cooking Equipment	12
Ballast: Electronic, for display case	16	High Efficiency Engine	15
Defrost	16	Kiln/Oven/Furnace	20
FHP & EFF Conditioner	16	Thermal Night Curtains	5
High-efficiency Liquid Suction Heat Exchangers	16	Custom Measures – SPC	15
Night Shields on Refrigerator and Freezer Cases	16	Local Government Initiatives	11
Refrigerator: Evaporative Fan Controller	5	Extrusion Equipment	15
Supermarket Systems	14	Audits	3
		Plug Load Sensor	10
		Information	1
		High Efficiency Motors	15
		Variable Frequency Drives	15
		Process Overhaul	20
		Pump Test	15
		System Controls	15

Net-to-Gross Ratios

Net-to-gross ratios (NTGRs) are used to estimate free-ridership occurring in energy efficiency programs. Free riders are program participants who would have undertaken an activity, whether or not there was an energy efficiency program promoting that activity. An NTGR is a factor that represents the net program load impact divided by the gross program load impact. This factor is applied to gross program savings to determine the program's net impact.[9] This factor is important in determining actual energy savings attributable to a particular program, as distinct from energy efficiency occurring naturally (in the absence of a program).

Applicants should refer to the SPM to determine the appropriate manner in which to use NTGRs in submitting program cost-effectiveness information.

Program proposals should use the applicable NTGRs listed below. If a program is not listed below, or if a proposed program design deviates substantially from past design of related programs, program proposals may utilize a default NTGR of 0.8 until such time

[9] Source: p. 26 of September 25, 2000 CALMAC report, referencing D.00-07-017 ordering paragraph 9.

as a new, more appropriate, value is determined in the course of program evaluation. All existing programs not listed below shall also use a default value of 0.8.

Table 4.2. Net-to-Gross Ratios

Program Area/Program	Net-to-Gross Ratio
Residential	
Appliance early retirement and replacement	0.80
California Home Energy Efficiency Rating System (CHEERS)	0.72
Residential Audits	0.72
Refrigerator Recycling/Freezer Recycling	0.53/0.57[10]
Residential Contractor Program	0.89
Emerging Technologies	0.83
All other residential programs	0.80
Nonresidential	
Advanced water heating systems	1.00
Agricultural and Dairy Incentives	0.75
Coin Laundry and Dry Cleaner Education	0.70
Commercial and agricultural information, tools, or design assistance services	0.83
Comprehensive Space Conditioning	1.00
Lodging Education	0.70
Express Efficiency (rebates)	0.96
Energy Management Services, including audits (for small and medium customers)	0.83
Food Services Equipment Retrofit	1.00
Industrial Information and Services	0.74
Large Standard Performance Contract	0.70[11]
All other nonresidential programs	0.80
New Construction	
Industrial and Agricultural Process	0.94
Industrial new construction incentives	0.62
Savings by Design	0.82[12]
All other new construction programs	0.80

Discount Rate

In evaluating all energy efficiency program proposals, the Commission shall use a pre-established discount rate of 8.15%. This standard assumption, used as the default in

[10] D.03-04-055, Attachment 2, page 7 (Program Descriptions)

[11] "Improving the Standard Performance Contracting Program: An Examination of the Historical Evidence and Directions for the Future," XENERGY, Nov. 29, 2001, page E-6, footnote 2.

[12] "An Evaluation of the Savings By Design Program," RLW Analytics, March 31, 2003, page 3, Table 2 and page 5.

recent years, may be updated in the future. The discount rate is used simply to translate potential benefits in future years into current year terms.

Avoided Costs

In order to estimate the value of the energy efficiency occurring as a result of program activities, parties will need to be able to estimate the "avoided cost" of the provision of that supply of energy. Avoided costs represent the value of the electricity or natural gas that, in the absence of a program, would need to be procured and delivered to an individual consumer. When an energy efficiency programs creates a reduction in demand for electricity or natural gas, costs are avoided from the perspective of the consumer, the utility, and society.

The Commission will continue to use six sets of avoided cost streams for the generation of electricity and the procurement of natural gas. These values should be used in the TRC-Societal Version Test, to apply to all program proposals on a statewide basis:

Electric

- Avoided generation costs
- Avoided transmission and distribution costs
- Environmental externalities

Gas

- Commodity procurement costs
- Transmission and distribution costs
- Environmental externalities

The Commission will use retail rates for the avoided cost streams used in the Participant Test, as prescribed by the SPM. These retail rates are specific to both the IOU territory and the program participant rate class in which an energy efficiency program is operating.

Not all of the above-avoided cost streams are necessary for all cost-effectiveness tests described in the Standard Practices Manual. Refer to that manual for more details on how to use the avoided cost streams.

Table 4.3 gives the Commission's generation of electricity and procurement of natural gas avoided cost assumptions. Sources of each stream of values are given below the table. These estimates will be updated as necessary. Any new avoided costs will be utilized on a prospective basis for future program planning, and not applied retroactively to evaluate existing programs that were developed based on an earlier set of avoided cost assumptions.

Table 4.3. Electric and Gas Avoided Costs

	Electric ($ per MWh)				Gas ($ per therm)			
Year	Generation	Trans. & Dist.	Env. Ext.	Total Electric	Commodity	Trans. & Dist.	Env. Ext.	Total Gas
2002	$99.05	$5.25	$6.55	$110.85	$0.49	$0.03	$0.06	$0.58
2003	$56.71	$5.50	$6.80	$69.01	$0.37	$0.03	$0.06	$0.47
2004	$53.41	$5.74	$7.04	$66.19	$0.34	$0.03	$0.06	$0.43
2005	$54.51	$6.00	$7.20	$67.71	$0.35	$0.03	$0.06	$0.45
2006	$49.61	$6.20	$7.40	$63.21	$0.37	$0.03	$0.07	$0.47
2007	$51.55	$6.50	$7.60	$65.65	$0.39	$0.03	$0.07	$0.49
2008	$53.25	$6.75	$7.85	$67.85	$0.40	$0.04	$0.07	$0.51
2009	$55.10	$7.04	$8.14	$70.28	$0.42	$0.04	$0.07	$0.53
2010	$57.08	$7.34	$8.34	$72.76	$0.44	$0.04	$0.07	$0.55
2011	$58.96	$7.60	$8.60	$75.16	$0.38	$0.04	$0.08	$0.49
2012	$61.38	$7.94	$8.84	$78.16	$0.40	$0.04	$0.08	$0.51
2013	$63.99	$8.30	$9.10	$81.39	$0.42	$0.04	$0.08	$0.53
2014	$66.76	$8.60	$9.40	$84.76	$0.43	$0.04	$0.08	$0.56
2015	$69.76	$9.00	$9.70	$88.46	$0.45	$0.04	$0.09	$0.58
2016	$73.00	$9.34	$9.94	$92.28	$0.48	$0.04	$0.09	$0.61
2017	$76.49	$9.74	$10.24	$96.47	$0.50	$0.04	$0.09	$0.63
2018	$80.23	$10.14	$10.54	$100.91	$0.52	$0.05	$0.09	$0.66
2019	$84.28	$10.55	$10.81	$105.64	$0.54	$0.05	$0.10	$0.68
2020	$88.44	$10.59	$11.08	$110.11	$0.57	$0.05	$0.10	$0.71
2021	$92.87	$11.12	$11.36	$115.34	$0.59	$0.05	$0.10	$0.74
2022	$99.42	$11.52	$11.67	$122.61	$0.61	$0.05	$0.10	$0.76
2023	$102.22	$11.91	$11.98	$126.11	$0.64	$0.06	$0.11	$0.81

Data Sources

Electric

1. **Avoided Costs of Generation.** These values are based on an August 2000 California Energy Commission forecast of market clearing prices using the MULTISYM model. Values for certain years were updated based on direction given in an October 25, 2000 ALJ Ruling on PY2001 planning in A.99-09-049, subsequently adopted by the Commission in D.01-01-060. Modifications to the CEC forecast were as follows:

Table 4.4. Assumptions for Electric Generation Costs

Program Years	Basis
2004-2010	CEC market clearing price forecast, plus 20%
2011-2020	CEC market clearing price forecast
2021-2023	CEC market clearing price escalated by growth rate over previous five years

In addition, the values reflected in Table 4.3 incorporate an "on-peak" multiplier, as ordered in the ALJ ruling of October 25, 2000 to account for the system value of reduced load on reducing market clearing prices, pursuant to AB970, Section 7,

Table B, Paragraph 8, and the September 14, 2000 and October 25, 2000 ALJ rulings in A.99-09-049. The on-peak multipliers are described in Table 4.5.

Table 4.5. On-Peak Multipliers

Program Years	Multiplier
2004-2005	2.0X
2006-2021	1.5X

2. **Electric Transmission and Distribution Avoided Costs.** The T&D avoided cost value-stream is calculated based upon a statewide average of weighted forecasts of avoided T&D costs across utility service territories. This forecast was based upon 1996 sales for each utility, and converted from $/kW to $/MWh by assuming a 0.6 load factor. These values were adopted by the Commission in Resolution E-3592.

3. **Electric Environmental Externalities.** These values were adopted by the Commission in Resolution E-3592.

4. **Gas Avoided Commodity Costs.** Gas procurement costs are based on the CEC's August 2000 base case price forecast for electric generation.

5. **Gas Transmission and Distribution Avoided Costs.** These values represent a weighted average of gas T&D costs in PG&E, SDG&E, and SoCalGas territories, as represented by each utility in their PY2000 annual reports.

6. **Gas Environmental Externalities.** These values were recommended by the CBEE and adopted by the Commission in Resolution E-3592.

All values (2-6) have been escalated by their average growth rate over the previous five years for the years 2022-2023.

Table 4.6 gives the Commission's avoided cost assumptions used in the Participant Test. These avoided costs are based on current IOU retail electricity and natural gas rates, and will be escalated in Participant Test calculations based on the CEC's GDP deflator series.

Table 4.6 Avoided Cost Assumptions by Service Territory

	Electricity ($/kWh)			Natural Gas ($/therm)		
	PG&E	SCE	SDG&E	SoCalGas	PG&E	SDG&E
Residential	0.13	0.14	0.16	1.07	0.89	1.31
Agricultural	0.14	0.11	0.15	0.74	N/A	N/A
Small Commercial	0.17	0.18	0.17	0.87	0.87	0.93
Medium Commercial	0.16	0.15	0.12	0.77	0.73	0.81
Large Commercial	0.14	0.13	0.12	0.63*	0.67*	0.63*

* Large commercial gas rates are based on a $0.50/therm commodity cost.

Flexible Cost-Effectiveness Inputs

The Commission uses CEC's Database for Energy Efficient Resources (DEER)[13] for two crucial sets of inputs to the standard cost-effectiveness tests. These are:

- Incremental Measure Costs
- Per-Unit Energy Savings Estimates

This database is updated periodically and available over the Internet, (at http://www.energy.ca.gov/forecasting/DEER.html), but may not offer appropriate values for all circumstances. If information for cost-effectiveness test inputs is not available through this database, parties proposing programs must develop and include the necessary information using alternate sources. If the source of incremental measure cost or per-unit energy savings assumptions is not the DEER, documentation supporting the inclusion of the new information must be provided.

[13] The California Public Utilities Commission provides funding for the CEC Database for Energy Efficient Resources.

5. Budgets and Compensation

Budgets

The table below shows the amount of ratepayer funds collected annually in each IOU service territory to fund energy efficiency program activities. By statute,[14] funds must be spent in the service territory from which the funds were collected. Thus, for example, funds collected from PG&E customers may not be spent in SDG&E territory.

Proposals to implement programs on a statewide basis (or in more than one large IOU service territory), should estimate the amount of funding required from each utility using a proportional budget allocation.

Table 5.1. Annual Collections by Service Territory

Utility Service Territory	Electric Budget	Gas Budget	Total Annual Budget	Percentage of Total
PG&E	$106,000,000	$12,888,000	$118,888,000	43%
SCE	$90,000,000	$0	$90,000,000	33%
SDG&E	$32,000,000	$5,500,000	$37,500,000	14%
SoCalGas	$0	$26,995,000	$26,995,000	10%
Statewide Total	**$228,000,000**	**45,383,000**	**$273,383,000**	100%
Percentage of Total	83%	17%	100%	

Any program proposal submitted for Commission consideration should include an itemized budget. See the latest Instructions (accessible at the website mentioned in Appendix A) for the required budget elements and format provided by the Commission's Energy Division.

Audit

The Commission retains the right to audit any and all expenditures for which the funding source is either the electric PGC or the gas PGC. The Commission and/or its agents may audit IOU expenditures, as well as any contracts or subcontracts utilizing this funding.

[14] Public Utilities (PU) Code Sections 381 and 399 authorize the electric PGC. Section 399.8 requires adjustment to this funding in future years, based on the growth of electric sales and the national Gross Domestic Product (GDP) deflator. Resolutions E-3792 and E-3807 provide utilities directions for the collection and tracking of electric PGC funds. PU Code Sections 890-900 authorize the gas PGC and collection associated with this charge is guided by these codes.

Compensation

With the exception of the IOUs, program implementers will be operating under a signed contract with standardized terms and conditions (Appendix A provides a link to the current version of the Agreement for Non-Utility Energy Efficiency Implementers). The contract administrator shall review required reports and any accompanying invoices that are required by the terms of the contract. After completion of its review, the contract administrator shall make payment of the undisputed amount, less certain costs identified in the contract terms, within a specified time period. The amount withheld will be available for the implementer's final payment.

The Commission reserves the right to make proportionate reductions in implementer's final payment in the event the final report and/or EM&V report show that the implementer did not meet program goals. In general, the contract agreement details the cost reporting requirements, review process and other supporting documentation requirements for payments to be received by implementers.

6. Evaluation, Measurement & Verification Requirements

Overall Requirements

All programs approved by the Commission for implementation must include evaluation and/or measurement and verification components. Information-only programs require an evaluation plan, but will not require the measurement and verification (M&V) components. Program implementers are required to have an independent EM&V consultant develop the evaluation plan for their program and conduct the program evaluation itself. All Commission funded programs must develop a plan for accomplishing some or all of the following EM&V objectives of the Commission:

- Measuring level of energy and peak demand savings achieved (except-information-only)
- Measuring cost-effectiveness (except information-only)
- Providing up-front market assessments and baseline analysis, especially for new programs
- Providing ongoing feedback, and corrective and constructive guidance regarding the implementation of programs
- Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory and approach
- Assessing the overall levels of performance and success of programs
- Informing decisions regarding compensation and final payments
- Helping to assess whether there is a continuing need for the program.

Not all of the objectives above may be applicable to all programs. Implementers or their EM&V consultants are free to propose an EM&V approach that is logical for their program, but any plan in which one or more of the above objectives is omitted should contain a strong supporting argument for the omission.

The Commission Energy Division will also work with an overall team of evaluators and M&V consultants to assist program implementers with planning and executing the finer points of their EM&V plans once programs are approved. For the M&V portion of the plan, implementers should adhere to the guidelines in the International Performance Measurement and Verification Protocol (IPMVP), available on the Internet at http://www.ipmvp.org/.

All EM&V plans, in addition to discussing and meeting the objectives above, should also include the components discussed below in detail. These components are not required to be delineated completely at the initial program proposal stage, but will be required to be included in the final approved EM&V plan.

Table 6.1. Components of an EM&V plan

Baseline Information
• Determine whether or not baseline data exist upon which to base energy savings measurement. Existing baseline studies can be found on the California Measurement Advisory Committee website (http://www.calmac.org/) and/or the California Energy Commission website (http://www.energy.ca.gov/). Detailed sources of baseline data should be cited.
• If baseline data do not exist, the implementer will need to conduct a baseline study (gather baseline energy and operating data) on the operation(s) to be affected by the energy efficiency measures proposed.
• If the baseline data do not exist and the implementer can show that a baseline study is too difficult, expensive or otherwise impossible to carry out prior to program implementation, the contractor should then provide evidence that baseline data can be produced or acquired during the program implementation. This process should then be detailed in the EM&V plan.
Energy Efficiency Measure Information
• Full description of energy efficiency measures included in the program, including assumptions about important variables and unknowns, especially those affecting energy savings.
• Full description of the intended results of the measures.
Measurement and Verification Approach
• Reference to appropriate IPMVP option.
• Description of any deviation from IPMVP approach.
• Schedule for acquiring project-specific data.
Evaluation Approach
• A list of questions to be answered through the program evaluation.
• A list of evaluation tasks/activities to be undertaken during the course of program implementation.
• A description of how evaluation will be used to meet all of the Commission objectives described above.

Reporting Requirements

Reports

All implementers of PGC-funded energy efficiency programs will be required to submit reports on a regular basis (frequency as specified in the contract) to the IOU contract administrator and the Commission in order to monitor progress. These reports should also be made available to all interested parties in relevant Commission proceedings and/or posted electronically on a website for ready access by other members of the

public. The reports shall contain information on program budgets and expenditures; projects, measures, and/or activities that were funded; the amount of energy savings and peak demand reductions associated with the program expenditures; and other information necessary to monitor compliance with Commission guidelines.

In particular, the Commission will be interested in monitoring progress toward achieving energy and peak demand savings goals established at the beginning of the program implementation process. Reports should show a comparison of progress with ultimate program goals.

Submittal dates for the required reports shall be detailed in the contract. The specific format and contents for these reports will be contained in the Reporting Instructions to be issued by the Energy Division before programs start.

During the term of the contract agreement, implementers shall respond to request for information from the contract administrator and Commission staff in a timely fashion but no later than five days after the date the information is requested, unless the implementer asks for an extension of time and such an extension of time is granted by the requesting party or parties.

Final Reports

In addition to the regular reports described above, a final report will be required to be filed for each approved program. The specific format and contents for these reports will be contained in the Reporting Instructions to be issued by the Energy Division.

The contract administrator shall determine if the final report is correct and complete, including the completed EM&V report, and shall notify the Commission staff. (See contract terms on final report and receipt of final payment.)