Energy Efficiency

Bonneville Power Administration

Post-2006 Conservation Program

Reimbursement Strategies and Levels

August 17, 2005

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Executive Summary

The Post-2006 Conservation Phase 2 Committee met with BPA over a two-month period to provide review and comment on proposals from BPA regarding the details of conservation implementation for the new rate period. This document summarizes the outcome of the Phase 2 process regarding reimbursement strategies and levels for BPA's Post 2006 conservation programs. BPA will use this document as the basis for developing the Implementation Manual for the new programs and detailed bilateral contract terms and conditions. These documents will be available this fall.

Partway through the Phase 2 process BPA agreed to establish early start options for the next rate period, allowing utilities to close out their current rate credit and/or Conservation Augmentation (ConAug) agreements and implement the new bilateral Conservation Acquisition Agreements (CAA) and Conservation Rate Credits (CRC). Therefore, utilities may be transitioning to the new bilateral contracts as early as Fall 2005.

<u>Among the key decisions:</u>

1. BPA's agreements (CRC and CAA) are between the utility and BPA, not between the consumer and BPA. The utilities will design and run programs, and BPA will design reimbursement rules and levels for the utilities. For that reason, BPA refers to its payments to utilities as reimbursements or credits, not "incentives" or "rebates."

2. BPA's decision to pay for achieved and measured conservation at set levels of reimbursement (deemed reimbursement, or cents per kWh up to a cap) allows utilities to determine how to design and operate their own programs to deliver the savings. This reflects two of the Phase 1 principles of local control and accounting simplicity.

3. Almost all options available under the CAA will be part of the CRC and *vice versa* as BPA lines up the offering to be consistent.

4. Subject to BPA legal and accounting review, administrative allowances of up to 15 percent are allowed (or 30 percent under the CRC for utilities with loads of 7.5 aMW or less). The administrative allowance will be assumed to be less than actual costs to the utility, and verification of the existence and scope of administrative costs that support energy efficiency will be the responsibility of state auditing/CPA auditing of the local utility.

5. Calculated reimbursements or credits will be offered by BPA based on the bus bar savings, thus, BPA is providing credit/reimbursement for reduced line losses.

6. Savings from both the CRC and the CAA must be reported in the Regional Technical Forum (RTF) reporting system.

7. Where appropriate, BPA will group like measures and provide an average reimbursement level to replace long lists of similar measures in the RTF reporting system. For example, the ESO+ list of measures and reimbursements for lighting will replace 6,200 separate lighting measures in the RTF database.

8. If there is a deemed reimbursement level for a particular measure, only that deemed reimbursement level will be provided by BPA. There will not be an option to substitute calculated savings or another deemed savings number from the RTF list.

9. For industrial projects, customers may choose at the time they sign their first agreement (either the CRC or CAA) to either accept 15 cents/kWh up to 60 percent of project costs (including technical services) and handle or pay for all technical services/audits on their own, or to accept 12 cents/ kWh up to 60 percent of project costs and have BPA arrange for technical services/audits.

10. CROSS CUTTING FEATURES: The following features will be consistent across all sectors (residential, commercial, industrial, agricultural and other sectors):

    - All custom projects (projects for which reimbursement is based on verified savings) require BPA approval of a measurement and verification (M&V) plan. Standardized M&V protocols will be provided for some measures prior to any project implementation activity such as equipment purchase.

    - Projects with a BPA reimbursement/credit level of $30,000 or higher must be submitted to BPA, prior to any project implementation activity such as equipment purchase, for review and comment. However, the ultimate decision to proceed with the project will be up to the utility and its consumers.

    - All new construction/major renovation, voltage regulation (CVR) and customer system efficiency improvement (CSEI) projects must be submitted to BPA for approval prior to any project implementation activity such as equipment purchase.

    - BPA will establish a target standard of service of 10 working days for completing the review and comment, M&V approval and special project approvals. An incomplete request will obviously hold up the final decision. A need for external expert review may also extend the 10 working day target.

11. There will be no new stranded investment clauses added to the CRC, but the current ConAug stranded investment clauses will be carried over to the CAA.

12. Generally, residential measures will be reimbursed at between 20 and 35 cents/first year kWh depending on the measure; industrial at either 12 or 15 cents; agricultural at 15 cents; and commercial at 13 cents.

Post-2006 Conservation Program: Reimbursement Strategies and Levels

Introduction

Goal of the Phase 2 Planning

For Phase 2 of BPA's Post-2006 Conservation program and planning process, BPA formed a committee. Members of the Phase 2 Committee were volunteers from the Phase 1 Workgroup. These members include representatives from east and west side utilities, large, medium, and small utilities, or utility organizations. The Phase 2 Committee focused on the technical aspects of implementation and delivery of the proposed Post-2006 Program Structure developed in Phase 1.

Through the Phase 2 process BPA sought to provide an attractive and effective approach to help customers achieve conservation targets at the lowest cost to BPA.

Purposes of this Document:

This document is the final draft of BPA decisions for its Willingness to Pay (WTP) levels and reimbursement strategies for conservation activities under both the Conservation Rate Credit (CRC) and Conservation Acquisition Agreements (CAA, or bilateral contracts).

1. The numbers and values proposed in this document represent BPA's best projections and intent at this time.

2. *The WTP and reimbursement strategies described in this document have not as yet been developed into specific contract terms.*

3. BPA's intent is to develop and provide a standard Conservation Rate Credit Implementation Manual and new standard bilateral agreements based on the details in this document and to incorporate these details into the RTF reporting system. Except where noted, most decisions apply to both the CRC and CAA. Any utility may request to establish an individually negotiated custom agreement for the CRC or the CAA. It is assumed that any custom agreement will be based on the same principles as the standard offerings. BPA will enter into a custom agreement when it is mutually beneficial, usually meaning when the agreement will directly or indirectly lower costs for BPA.

4. *The detailed contract terms and Implementation Manual will have to be reviewed by BPA legal and accounting functions.*

Conservation Program Principles

The Phase 2 process built on and elaborated on the principles from the February 2005 Short-term Regional Dialogue Policy and the June 28, 2005, Final Post-2006 BPA Conservation Program Structure. The following key principles are quoted from the Conservation Program Structure. The ***italicized*** words below are the elaborations of the principles based on discussions between BPA and the Phase 2 Committee.

1. **Conservation Achieved at the Local Level:** The bulk of the conservation to be achieved is best pursued and achieved at the local level. There are some initiatives that are best served by regional approaches (for example, market transformation through the Northwest Energy Efficiency Alliance). However, the knowledge local utilities have of their consumers and their needs reinforces many of the successful energy efficiency programs being delivered today.

- Local Control: BPA will foster local utility initiative and control of conservation efforts to the maximum extent it can, consistent with meeting cost and verification goals.

- Each utility may choose the incentive level to pay the end user but is credited only the amount BPA offers for each cost-effective measure.

- *BPA will design systems for payments or utility reimbursement/credit, not design individual utility programs. Using BPA's WTP and rate credit/contract specifications, each utility is free to design its own incentives, marketing, or delivery mechanisms. BPA will need to do site verifications as part the agreement with the utility, but this is not the same as dictating the relationship between the utility and its consumer; BPA's focus is on the interaction between BPA and its utility customers.*

2. **Achieve Conservation at Lowest Cost Possible to BPA:** BPA will seek to meet its conservation goals at the lowest possible cost to BPA. While only cost-effective measures and programs are a given, the region can benefit by working together to jointly drive down the cost of acquiring those resources.

- *BPA's first concern is achieving cost-effective savings on a total resource cost (TRC) basis; the secondary consideration is making efficient use of available ratepayer funding for conservation by minimizing free-ridership. Situations in which free-ridership might lead to inefficient use of BPA's conservation funding will be considered at the program design stage in most cases.*

- BPA's willingness to pay may vary by sector and measure, and will reflect the actual cost to acquire resources in each sector. It may also reflect program implementation realities.

    a. *In setting WTP, BPA considers what it may take to move the market, which includes providing a sufficient signal to the market and the recognition of hard to reach (HTR) market segments, the likely measure life of the savings, the need to capture*

lost opportunities, as well as meeting the overall cost target per aMW for 52 aMWs a year.

b. In establishing a WTP level, BPA is not attempting to pay the entire cost of measures. Cost share is expected. Paying less than the full cost, or paying less than some utilities believe is sufficient, is not intended to cause a utility cost-share. Rather, a utility may require the end-use consumer to pay the cost share. BPA does, however, recognize that some utilities, within their own program designs, may contribute some additional funding.

3. **Administrative Support:** BPA will continue to provide an appropriate level of funding for local administrative support to plan and implement conservation programs.

- Reimbursement of administration costs at a rate up to 15 percent of the allowable costs may be included with the project budget and reimbursed by BPA.

- BPA will allow up to 30 percent of their rate credit for administrative costs for small utilities (7.5 aMW or less).

c. BPA intends that the administrative cost allowed under CAA and CRC to be an allowance, not a reimbursement of actual documented costs (other than state/CPA audit review for existence of administrative cost; see Appendix A).

- BPA engineers will provide custom proposal reviews to the extent engineering resources are available.

- *BPA will support local utility programs to the extent possible, by specifically providing "tools" such as sample program marketing and implementation materials that can reduce utility or consumer confusion and simplify local utility program administration. In general, these "tools" will reduce local utility administrative costs and will be formatted to allow for local utility customization.*

4. The list of qualified, cost-effective measures, deemed kWh savings and payment rate per measure will generally be consistent across programs. However, BPA retains the flexibility to negotiate custom agreements.

- *BPA will strive to make rules <u>consistent</u> across both the rate credit and the bilateral contract areas such as:*

d. BPA's WTP for a specific application of a measure;

e. The level of oversight, tracking, reporting, utility verification, and measurement of savings; and

f. BPA's openness to negotiating custom contracts using the same criteria for negotiation across reimbursement methods.

- *In general,* if there is a deemed reimbursement or credit level for a particular measure, only that deemed reimbursement or credit level will be provided by BPA. There will not be an option to substitute calculated savings or another deemed savings number from the RTF reporting system.

5. BPA will strive to provide simplified contracts.

- *Before imposing a contractual requirement, BPA will ask itself why it is important or necessary. BPA is committed to clear, concise, and streamlined approaches.*

- *In most cases, where there are simplified reimbursement/credit schemes, the reporting of actual savings and/or measures installed in the RTF reporting system will still be required.*

6. BPA will strive to provide a streamlined approval process

Basic Building Blocks

The fundamental way BPA will provide for local control and innovation is to structure its relationship to the utilities by reimbursing/crediting them for the verified energy savings they capture at either the cents per kWh up to the cost share amount (whichever is less), or by reimbursing/crediting them for the measures installed as provided in BPA's willingness to pay. How the utilities spend the reimbursements or the expenditures they make in their effort to capture the savings is between the utilities and their consumers. This allows maximum freedom for the utility to innovate, negotiate, and leverage the reimbursement/credit amount. BPA is getting what it pays for at a price that BPA believes is fair, effective, and meets BPA's least cost criterion[1].

BPA will meet its requirement to achieve all cost-effective savings at the lowest possible cost to BPA by establishing reasonable levels of WTP, and by requiring a cost share to cap BPA's investment.

BPA will offer a simplified payment and review structure, which will reduce the burden of accounting and oversight. In addition, the planned levels of "Review and Comment" on proposals will provide the utility both more freedom and flexibility to seek assistance. The treatment of accounting for the administrative cost allowance will be consistent with the previous Conservation and Renewables Discount (C&RD). BPA will place the responsibility for verifying that there is a reasonable basis for the allowance in the hands of the state/CPA auditors for each utility.

Administrative Costs

See Appendix A

[1] This does not imply that the utility will not have to track the costs of most commercial/industrial and agricultural projects, because the decision to pay per kWh or invoke the cost-share cap depends on knowing the actual incremental cost. This means that tracking and documenting will include all project conservation costs in order to determine the reimbursement level.

Influences on BPA's Willingness to Pay (WTP)
Each time WTP is described in this document, the WTP is followed by an acronym, in parentheses, that reflects BPA's main reasoning behind the reimbursement level. A key to the WTP acronyms follows in Appendix B, Definitions.

To avoid confusion, BPA's reimbursement/credit to the utility for savings achieved is based on bus-bar savings, which is generally 7.5 percent above the site savings[2]. This is consistent with the way BPA's aMW targets and its WTP are set. All reimbursements are restricted to savings from cost-effective measures.

CROSS CUTTING FEATURES
The following features will be consistent across all sectors (residential, commercial, industrial, agricultural, and other sectors):

- All custom projects (projects for which reimbursement is based on verified savings) require BPA approval of a measurement and verification (M&V) plan. Standardized M&V protocols will be provided for some measures prior to any project implementation activity such as equipment purchase.

- Projects with a BPA reimbursement/credit level of $30,000 or higher must be submitted to BPA, prior to any project implementation activity such as equipment purchase, for review and comment. However, the ultimate decision to proceed with the project will be up to the utility and its consumers.

- All new construction/major renovation, voltage regulation (CVR) and customer system efficiency improvement (CSEI) projects must be submitted to BPA for approval prior to any project implementation activity such as equipment purchase.

- BPA will establish a target standard of service of 10 working days for completing the review and comment, M&V approval, and special project approvals. An incomplete request will hold up the final decision. A need for external expert review may also extend the 10 working day target.

RESIDENTIAL SECTOR
The main cost-effective applications in the residential sector are: lighting, HVAC, weatherization, new construction, and appliances. BPA customers want to stay active in this sector, even though the Northwest Power and Conservation Council sees little remaining potential outside of lighting and the future generation of heat pump water heaters. By keeping costs down through a sector mix of a generous amount of lower cost CFL savings with higher cost measures, incentives can be set high enough to allow for non-CFL cost-effective technologies that provide a basis for many utility residential efforts. BPA's WTP decisions for specific residential measures or projects are described below.

[2] Decrementing utilities may choose to accept payment for, and take a decrement for only the 5 percent distribution line losses.

Residential ENERGY STAR® CFL Lighting (MB; WTP)
BPA will reimburse the utility $2.50 per socket (screw-in or pin-based) as the standard WTP. Installed CFL wattage must be more than 5 Watts

There are special situations for which BPA may be willing to pay more. BPA will reimburse $4 per socket for customer proposals to get CFLs into hard to reach (HTR) or special opportunity segments. Such customer proposals must be approved by BPA and must include a justification for why the segment is hard to reach or a special opportunity. BPA is open to most ways to deliver products to such segments. These proposals may include lighting with additional measures such as showerheads in multifamily rental units or combined with duct sealing in manufactured homes to avoid missing savings opportunities and to make efficient use of site visits.

(Again, whether the utility chooses to pay more or less for a specific bulb, or to substitute fixtures, the BPA WTP to the utility remains the same.)

Heat Pumps (CP; LO)
BPA proposes a simplified approach to reimbursements for residential air-source heat pumps.

- BPA will set specific levels of performance with the reimbursement/credit based on the upgrade (incremental) savings, regardless of the consumer's reasons for the installation of a heat pump.

- BPA will eliminate distinctions based on when the home was built, but will distinguish among climate zones and whether or not the home's ducts are outside the conditioned space. BPA will post the reimbursement/credit level for utilities with separate values for situations in which the ducts are outside of the conditioned space and for those where there is no substantial ducting outside the conditioned space.

- Although the prescriptive minimum performance standard will be required at SEER 14, HSPF 8.5, and PTCS® with performance-tested (PT) ducts as applicable, higher levels of efficiency can be encouraged by offering 20 percent more for homes with duct testing and 40 percent more for homes where there is no substantial ducting outside the conditioned space for upgrading to a 9.5 HSPF (with SEER 14 and PTCS)[3].

- Homes over 4,500 square feet, which is twice the size of the prototypes used by the RTF to estimate savings, are allowed two incentives (for two heat pumps or for a very large and efficient unit).

Although it is possible that further analysis by the RTF may result in slightly different values for the savings from upgrades, the following table reflects expected reimbursement values, rounded up, at $0.25 per kWh. BPA will reimburse/credit based on the heat pumps installed and claimed.

[3] While the percentage increase in willingness to pay in non-crawlspace homes is much larger, it is a smaller base number, and is due to the disproportionate effect that equipment efficiency has in the absence of Performance Tested ducts.

Table 1: Reimbursements for Heat Pumps

	W/Crawl[4]	W/Crawl	Non-crawl	Non-crawl
Zones\Efficiency	8.5 HSPF	9.5 HSPF	8.5 HSPF	9.5 HSPF
Heating 1, Cooling 1	$615	$740	$270	$380
h1 c2	$635	$760	$280	$390
h1 c3	$675	$810	$300	$420
h2 c1	$1,080	$1,295	$450	$630
h2 c2	$1,090	$1,310	$465	$650
h2 c3	$1,125	$1,350	$485	$680
h3 c1	$1,430	$1,715	$580	$810
h3 c2	$1,450	$1,740	$590	$825
h3 c3	$1,490	$1,790	$615	$860

Weatherization Measures (CP; LML)

Although there is relatively little cost-effective weatherization left to do in electrically-heated homes, the incentives need to be high enough to move the remaining market. Because the proportion of weatherization measures in the BPA portfolio is likely to be low and the measure lives are expected to be long, BPA will offer $0.30 per kWh savings for the cost-effective retrofit measures in the RTF list. No cost cap is seen as necessary due to the high cost of these measures relative to BPA's WTP.

To the extent there is cost-effective retrofit weatherization in the RTF list for multifamily and manufactured homes, the reimbursement will be the same $0.30 per kWh.

Water Heaters (CP; LO)

Although the most recent RTF tables currently indicate these units are cost-effective at future prices, BPA doesn't anticipate many advances in heat-pump water heater technology over the first five years of the Council Plan. A reliable model is not currently widely available on the market. BPA can add a reimbursement/credit for this technology later when there is a reliable unit available at a cost-effective price.

The RTF distinguishes two levels of cost-effective savings for tanks of 50 gallons or more depending on the warranty provided – 20 years or more, and less than 20 years. The incremental cost of the 20-year warranty ranges between 45 cents and 55 cents/incremental kWh, and the cost for the less than 20-year warranty ranges between 25 cents and 35 cents/incremental kWh. In this case, BPA is willing to pay more toward the 20-year warranty because it has a longer measure-life.

[4] "With crawl space" and "without crawl space" are shorthand for homes with ducts outside the conditioned space where duct testing and sealing can result in higher savings gains, and homes without substantial ducting outside the conditioned space, respectively.

The suggested WTP is $0.25 per kWh for the tank with less than a 20-year warranty, and $0.35/kWh for the longer warranted tank (according to the bus bar savings in the RTF list).

Gravity film heat exchangers also are an eligible measure at $0.35 per kWh.

New Home Construction (LO; LML; MB)

New home construction represents a lost opportunity for conservation. It is generally assumed to have a very long measure life, but many of the efficiency measures have a shorter measure life than the structure, requiring periodic replacement – probably with even more efficient options over the life of the dwelling. Even though the savings above code and/or current practice are small, it is important to support an on-going presence in this sector to provide a market path for newer and more cost-effective measures as they become available. In the early years of the program, BPA expects low penetration, but the higher incentives suggested by the lost opportunity and long measure lives in new construction may be sustainable for at least the term of the new rate credit. Reimbursement/credit for new home construction is described below for different types of new homes.

ENERGY STAR® Homes

Electrically heated ENERGY STAR Homes are cost-effective in all climate zones and with both zonal heating and heat pumps. They often save substantial kWh, but it is difficult to make an impression on builders with a rebate when the overall cost of any new home is so high. Most of the real impact on builders will come from marketing. Even at 30 cents/kWh, heating zone (HZ) 1 will have incentives well below the incremental cost of the energy efficiency improvements. In zones 2 and 3, the incentives can cover the incremental cost. See Table 2, below.

Table 2: Zonal/Heat Pump Reimbursements for ENERGY STAR Homes

	Crawl spaces[5]	Non-crawl-spaces
Heating 1, Cooling 1 hp	$1,140	$ 600
h1 c2 heat pumps	$1,180	$ 600
h1 c3 heat pumps	$1,250	$ 600
All zonal $1,170		
h2 c1 heat pumps	$1,800	$ 850
h2 c2 heat pumps	$2,000	$ 850
h2 c3 heat pumps	$2,100	$ 850
All zonal $1,400		
h3 c1 Hp	$2,600	$1,020
h3 c2 Hp	$2,700	$1,020
h3 c3 Hp	$2,800	$1,020
All zonal $1,600		

Gas-heated homes are not TRC cost-effective, but appliance and lighting rebates can be provided to customers in gas-heated homes.

New Super Good Cents Manufactured Homes (LML; LO; CP)

Given the big increment in savings above HUD standards, SGC manufactured homes (MH) are very cost-effective, but 60 percent of the market is already SGC. Although there is a substantial risk of free-ridership, this is a market that is very sensitive to rebates. Market share could quickly be lost if incentives from the utilities were to stop. BPA will provide a reimbursement/credit of $0.30/kWh.

Table 3: Reimbursements/Credits for SGC Manufactured Homes

Heating Zone 1	$ 850
Heating Zone 2	$1,150
Heating Zone 3	$1,450

Multifamily New Construction (LO; LML; MB)

Multifamily (MF) new construction of four or more units and less than three stories can be made more efficient than code or standard practice. Such projects would qualify for residential new construction reimbursement. Because there are no prescriptive measures at this time, projects that qualify as being above code or standard practice efficiency will need to be reviewed and approved by BPA. Consistent with MH and single-family (SF) homes, $0.30 per kWh will be the applicable reimbursement level (with a cap of 70 percent of the incremental energy related

[5] See footnote 4 for the meaning of these classifications.

measure costs). The amount and type of measure and verification (M&V) required will be determined by the BPA reviewer, but is not expected to be complex.

MF housing three stories and above should be considered as commercial construction and submitted for new construction incentives and BPA pre-approval under the commercial sector WTP.

Geothermal Heat Pumps (LML; CP; LO)

Retrofit: Generally in HZ 1, geothermal heat pumps are cost-effective in site-built homes constructed before 1993, when there is (a) a forced air furnace, (b) a crawl space, and (c) there is a cooling load. A few exceptions exist for some configurations with a heat pump, a half-basement, and, rarely, a full basement.

For HZ 2, there is a dramatic shift. Most installations in site-built homes are cost-effective unless there is zonal heat, and, with some few exceptions, with a full basement built after 1993.

For HZ 3, almost every application is cost-effective, including most zonal heated homes.

Because of these commonalities and the fact that there may be very few requests for this technology, BPA will offer a simplified reimbursement scheme. BPA will pay 25 cents/kWh, not to exceed the incremental cost above the air-source heat pump.

Table 4: Reimbursements for Geothermal Heat Pumps

Heating Zone		
HZ 1:	Site-built homes constructed before 1993, when there is (a) a forced air furnace, (b) a crawl space, and (c) there is a cooling load	$2,400
HZ 2	Site-built homes with a HP or forced air furnace (FAF)	$3,000
HZ 3	Site-built homes -- air-source heat pump as a base	$3,000 (to avoid paying beyond incremental cost)
HZ 3	FAF/zonal as a base	$3,500.

New Construction in SF: In heating zones 2 and 3, BPA will reimburse $3,000 for ground source heat pumps, based on the expectation that the baseline is an air-source heat pump.

Cost-effective geothermal heat pumps for all MF and commercial new construction applications will be reimbursed according to the commercial sector reimbursement schedule.

Manufactured home installations of geothermal heat pumps will be reimbursed 25 cents/kWh using the RTF list to determine the savings for this measure. BPA's payment will be capped at $3,000.

Miscellaneous

Line Voltage Electronic Thermostats in single-family homes will be reimbursed/credited at approximately 20 cents/kWh as listed in Table 5.

Table 5: Reimbursements/Credits for Line Voltage Electronic Thermostats

HZ 1	$ 80
HZ 2	$115
HZ 3	$135

ENERGY STAR Clothes Washers (LO; CP; MB)
(Modified energy factor (MEF) 1.72 is the expected 2007 ENERGY STAR level)
Due to an option for early start that will precede the new E-Star standards, clothes washers can have two tiers until January 1, 2007: E- Star below 1.79 at $60 and E-Star at 1.80 and above at $100. After the new ENERGY STAR standards are effective, BPA will reimburse at two levels for all ENERGY STAR residential clothes washers depending on the fuel used to heat water. For installations in homes that use electricity to heat water, the reimbursement level will be $70; for those who heat water with other fuels, the reimbursement/credit will be $25.

ENERGY STAR Dishwashers (LO; CP)
Currently 86 percent of the market is E-STAR rated. BPA expects the ENERGY STAR standard to change in the next year. In order to provide an incentive to gas-heated ENERGY STAR homes, provide an option for small utilities, and to avoid stopping and starting a program with retailers, BPA will reimburse/credit $25 for ENERGY-STAR-rated dishwashers.

PTCS Duct Sealing in Retrofitting Manufactured Homes (MB; WTP)
SGC Manufactured Homes are not cost-effective to retrofit, but regardless of the existence of a HP or FAF (most expected), the electrically-heated MH will qualify and the BPA reimbursement/credit will be approximately 30 cents/kWh

Table 6: Reimbursements for PTCS Duct Sealing in Manufactured Homes (All climate zones)

HZ 1	$280
HZ 2	$400
HZ 3	$400

As noted earlier under HTR lighting, combining this measure with direct install lighting may increase the value of the visit to the home and allow a combined higher reimbursement/credit.

Single-Family PTCS (WTP)
PTCS Duct Sealing as a stand-alone measure in SF site-built homes will be reimbursed/credited at $400 for all climate zones, as this approximates more than 60 percent of the estimated job costs.

ENERGY STAR Refrigerators (CP; LO)
BPA will reimburse/credit $25, primarily because the market is nearly transformed.

Residential Refrigerator Decommissioning (MB; WTP)
The RTF estimates the full cost of a decommissioning program is about $140 per unit, and the current value in the C&RD is $110. By limiting BPA's cost to 60 percent of the measure cost BPA will reimburse/credit $85 per unit. Decommissioning has a short measure life, and its expected high free-ridership is accounted for in the savings numbers, upon which the C&RD value was set.

Multifamily Showerheads and Aerators (WTP)
BPA will reimburse/credit 20 cents/kWh for the bus bar savings deemed in the RTF reporting system.

COMMERCIAL SECTOR
Lighting, HVAC, and commercial refrigeration dominate the savings opportunities in commercial buildings. Efficient power supplies for computers and power controls for networked computers also represent savings opportunities.

The overall structure for the commercial sector reimbursement/credit is shown below:

- BPA will pay specified reimbursements for selected measures (e.g., ESO+ lighting, computer controls, etc.) and

- BPA will pay a reimbursement/credit of 13 cents/kWh up to 60 percent of the project incremental cost for lighting, HVAC, and commercial refrigeration.

<u>Reimbursements for specific measures that are based on measure costs</u>

Network Computer Power Management (MB; WTP)
BPA will reimburse/credit $17 per workstation. This increase above current C&RD is due to higher market prices.

Pre-rinse Spray Wash valves (WTP)
BPA will reimburse/credit $150 per qualified installation. Qualified installations require that the water for dishwashing be heated with electricity and that the facility serve ten or more meals per week.

ENERGY STAR Commercial Clothes Washers
BPA offers two tiers of reimbursement/credit.

Table 7: Reimbursements/Credits for ENERGY STAR Commercial Clothes Washers

PRIOR to 2/1/07		
MEF 1.42-1.79	▪ Electric DHW and Dryers ▪ All other combinations	▪ $ 90 ▪ $ 45
MEF 1.80 and higher	▪ All electric ▪ All other combinations	▪ $180 ▪ $ 75
Starting 2/1/07		
ENERGY STAR	▪ All electric ▪ All other combinations	▪ $180 ▪ $ 75

80+ Efficient Power Supplies (MB; WTP; LO)
Currently handled through the Northwest Energy Efficiency Alliance (Alliance) to get computer hardware manufacturers on board. It may be necessary for local utilities to support the manufacturers' buy down once the initial Alliance funds are expended, probably through contributions to the Alliance at around $5 per computer. This measure lends itself more to the CRC than to CAA, but it is one way to acquire cost-effective resources with little administrative burden.

ESO+ Reimbursement/Credit Schedule
The current ESO+ reimbursement/credit schedule (capped at 70 percent of incremental installed cost) and requirements should be used for any size commercial, industrial, or institutional facility. For BPA's fiscal year 2005 and fiscal year 2006, BPA expects incremental costs will go down and availability and knowledge of the high performance T8 option and qualifying products will continue to improve.

Table 8: Reimbursements/Credits for Standard and High Performance T8 Lamps and Ballasts

Fiscal Year 2007	
HP T8 lamps and ballast (2-4 lamps) HP T8 lamps and ballast (1 lamp) Std T8 lamps and ballast (2-4 lamps) Std T8 lamps and ballast (1 lamp)	▪ $30 ▪ $15 ▪ $15 ▪ $ 8
Fiscal Year 2008	
HP T8 lamps and ballast (2-4 lamps) HP T8 lamps and ballast (1 lamp) Std T8 lamps and ballast (2-4 lamps) Std T8 lamps and ballast (1 lamp)	▪ $30 ▪ $15 ▪ $10 ▪ $ 5
Fiscal Year 2009	
HP T8 lamps and ballast (2-4 lamps) HP T8 lamps and ballast (1 lamp)	▪ $30 ▪ $15

Combined and Interactive Commercial Projects (MB; WTP)
Combined and/or interactive commercial projects that include lighting, commercial scale refrigeration, and HVAC measures, among other cost-effective measures that are calculated, will be reimbursed/credited at $0.13/kWh, not to exceed 60 percent of the incremental installed measure cost. The incremental cost for retrofit of existing lighting equipment is the full installed measure cost. For replacement of burned out/failing /failed refrigeration equipment, the incremental cost (and savings) is the cost above code for Consortium for Energy Efficiency (CEE) tier 1 equipment or its equivalent. For HVAC replacement, the incremental cost is the cost of equipment above the federal or state applicable standard for new or replacement equipment.

As described earlier in this document, for custom projects, utilities must submit an M&V plan for BPA approval prior to any project implementation activity such as equipment purchase. See Endnote for further discussion. In addition, projects with reimbursement/credit levels $30,000 and above will require "Review and Comment" by BPA, also prior to any project implementation activity.

New Construction and Major Renovations (LO; MB)
New construction and major renovations (multiple end-uses changed with a construction or building permit required) will be reimbursed on a performance-based approach that reimburses/credits the lesser of $0.20/kWh or 70 percent of incremental cost (which includes payments for design assistance/technical assistance) for improved efficiency above code. The key to project eligibility for the higher "new construction" reimbursement is the existence of an integrated design plan that usually involves modeling and a building construction permit. These projects are partly self-defining because the projects must be submitted to BPA for pre-approval. The higher reimbursement values are provided to allow the utility to bring the extra modeling and design resources to bear.

As described earlier in this document, all new construction/major renovation projects will require BPA approval of the project modeling and M&V plan.

AGRICULTURAL SECTOR (MB; CP; WTP)
Agriculture is a cash-constrained sector that requires significant motivation to make investments. Reimbursements/credits will be roughly based on $0.15/kWh not to exceed 70 percent of the incremental installed measure cost. The measures listed in Table 9 will be paid as shown in the table.

Table 9: Reimbursements/Credits for Agricultural Measures

1.	New flow-controlling type nozzle for impact sprinklers	$3
2.	Rebuilt or new brass sprinkler.	$4
3.	New rotating-type sprinkler replacing impact sprinklers	$3
4.	New gasket for wheel lines or hand lines	$1
5.	New low-pressure regulators with pivot sprinklers (entire pivot must be upgraded)	$6
6.	New multiple-configuration nozzles for low-pressure pivot sprinklers	$2
7.	New "goose neck" elbow for new drop tubes	$1
8.	New drop tube for low-pressure pivot sprinklers (min. 3 feet long)	$3

"New" is specified to avoid payments for replacement parts for existing low-pressure systems, which are seen as required maintenance.

Pump/motor improvements in the irrigation sector will be based on system audits and interactive measure calculations. Motor replacements are assumed to be in lieu of re-winds or at time of failure, and the incremental cost (and savings) is calculated off a National Electrical Manufacturers Association (NEMA) standard efficiency motor for the same size and application. They are TRC cost-effective because of their summer peaking load shapes in irrigated agriculture. The reimbursements/credits are found in the Table 10, below.

Irrigation motor rebates require that the motor is open drip proof, operates at 1,800 rpm, and is replacing older rewound motors.

Eligibility:

- Motors that qualify for a BPA reimbursement/credit may be purchased anywhere, but must be installed in an irrigated agriculture application.

- Motors must be:

    1. New, three-phase AC induction;

    2. 25 to 500 horsepower; and

    3. NEMA design A, B, or C

Motors must meet or exceed the NEMA Premium® efficiency standard shown in Table 10, below.

Table 10: Reimbursements/Credits for Irrigation System Motors

Assumed Operating hours per year = 2200

Nameplate HP	Existing Motor Efficiency	NEMA Premium Efficiency	Energy Savings	Max. Reimbursement/ Credit
25	88.0%	94.5%	2,400	$ 300
30	88.8%	94.5%	2,526	$ 310
35	89.3%	94.5%	2,688	$ 325
40	89.3%	94.5%	3,072	$ 370
50	89.3%	95.0%	4,210	$ 500
60	89.5%	95.0%	4,874	$ 585
75	89.5%	95.0%	6,093	$ 730
100	90.0%	95.4%	7,976	$ 975
125	90.3%	95.4%	9,416	$ 1,130
150	90.8%	95.8%	11,078	$ 1,330
200	91.0%	95.8%	14,180	$ 1,700
250	91.0%	95.8%	17,725	$ 2,130
300	91.0%	95.8%	21,270	$ 2,550
350	91.0%	95.8%	24,815	$ 2,980
400	91.0%	96.2%	30,723	$ 3,690
450	91.0%	96.2%	34,564	$ 4,150
500	91.0%	96.2%	38,404	$ 4,600

Other Agricultural Measures

For other agricultural measures, BPA will reimburse/credit 15 cents/kWh or 70 percent, whichever is less, including the following:

- Low pressure conversion with pump work
  - Change to 40 foot spacing on hand lines and wheel lines to enable conversion
- Low energy precision application (LEPA) conversion for pivots and lateral moves
- Adjustable speed drives in certain applications (multiple-valved sprinkler systems and field elevation differences of 25 feet or greater)

The cost of the technical studies needed to accomplish the project is assumed to be covered in the BPA reimbursement/credit amount to the utility and in the total project cost for purposes of cost-capping. As with industrial projects, custom irrigation projects need to be run through the

RTF calculator to determine TRC cost-effectiveness prior to submitting the M&V for approval by BPA.

As described earlier in this document, for custom projects utilities must submit an M&V plan for BPA approval prior to any project implementation activity such as equipment purchase. See Endnote for further discussion. In addition, projects with reimbursement/credit levels $30,000 and above will require "Review and Comment" by BPA, also prior to any project implementation activity.

Scientific Irrigation Scheduling (CP; WTP)
Scientific Irrigation Scheduling (SIS) might be reimbursed/credited based on the cost of service to qualifying fields, or paid using the water use and lift calculations provided by the recent BPA evaluation, or through other ways suggested by a future agriculture working group. Eventual inclusion of this measure depends on the savings estimates confirmed in current field studies and cost estimates that show a cost-effective TRC.) If SIS is shown to be cost-effective, BPA will development a reimbursement/crediting scheme, which may be available as early as Winter 2005-2006.

INDUSTRIAL SECTOR, INCLUDING WATER AND WASTEWATER TREATMENT

Cost based measure reimbursement
The ESO+ is required to be used for lighting measures in industrial facilities.

Other Cost-Based Industrial Reimbursements
There are no other pre-determined measures for the industrial sector. There will be no "motor rebate" program based on deemed hours of operation and assumed loading factors. Motors and drives will be eligible for calculated savings based on site-specific project analyses.

Calculated Industrial Savings (WTP)
Process-related projects include production systems within a particular industry (e.g., pulping in wood products, food processing, plastic extrusion, compressed air, computer chip fabrication, drive systems, or drying systems in lumber products). Process and drive systems will involve site-specific calculations -- motors, variable speed drives, pumps, ammonia-based refrigeration, etc. -- and will be eligible for reimbursement/credit as part of an integrated approach.

BPA will require the utility to choose path (A) or (B) below when it first signs up for either the rate credit program or a bilateral contract. This will establish the method to be used over the life of the longest lasting agreement (CRC or CAA) and will apply to all industrial projects, including water and wastewater treatment. The same reimbursement scheme will apply to all industrial in both the CRC and CAA projects within the utility.

BPA will either:
(A) Reimburse/credit the utility $0.15 per kWh (which includes the cost of technical assistance/audits) up to 60 percent of the project's incremental energy cost (which includes the cost of technical assistance/audits).

- The cost of the audit and technical assistance is included in either the "project cost" or captured within the 15-cent reimbursement level.

- The cost of "dry-hole" technical studies will be managed by the utilities within the overall reimbursement by BPA.

OR

(B) Reimburse/credit the utility at 12 cents per kWh (up to 60 percent of the incremental energy project cost) with BPA arranging for and paying for the technical assistance studies/audits. This takes the risk of "dry hole" audits away from the utility and shifts the expense from the utility to BPA.

Regardless of the choice of A or B:

- The utility must pre-screen the projects for TRC cost-effectiveness by using the RTF protocol-based calculator, supplying the cost, savings, and industry sector (to get the appropriate load shape) prior to submitting the M&V plan to BPA for approval. BPA will assign the RTF tracking number after approving the M&V plan.

- *As described earlier in this document, for all custom projects, utilities must submit an M&V plan for BPA approval prior to any project implementation activity such as equipment purchase*. Project paperwork shall include the basis for the savings estimates, as is required in the current Conservation Augmentation (ConAug) proposal worksheet.

- In addition, as described earlier, projects with a BPA reimbursement/credit level of $30,000 or higher must be submitted to BPA, prior to any project implementation activity such as equipment purchase, for review and comment. However, the ultimate decision to proceed with the project will be up to the utility and its consumers. *(See Endnote for further discussion.)*

Other Requirements

- No project with less than a one-year payback will be reimbursed/credited by BPA.

- Stranded cost repayment provisions will be required for CAA, but not for CRC.

BPA encourages all utilities to utilize technical assistance from third party service providers and from the Industrial Sector Initiative of the Alliance. Industrial savings can be hard to identify, and the industrial partners tend to trust trade allies they traditionally work with.

"OTHER" SECTOR

LED traffic signals and other non-building efficiency improvements can be reimbursed/credited at the rate of $0.13/kWh, up to 60 percent of the incremental project cost.

As noted earlier, conservation voltage regulation (CVR) projects, customer system efficiency (CSEI) distribution system upgrades for energy efficiency, and new construction/major renovation projects for C/I and MF residential will always require BPA approval prior to any project implementation activity and will require, as with all other custom projects, BPA approval of the project M&V plan prior to any project implementation activity.

ENDNOTE

BPA Review and Comment

As discussed extensively with the Phase 2 Committee, BPA does believe it is necessary for BPA to have some involvement in projects involving large amounts of ratepayer dollars even when the servicing utility is willing to take full risk of payment based only on the measured savings. The reasons for this are:

- Some large customers feel that they can afford to take risks with getting paid only for measured project savings, but many utilities want to minimize risk;

- Regardless of utility size, BPA cannot set up situations that can result in massive problems with customer relations that will follow from projects that are not pre-screened and turn out to be ineligible, unworkable, and/or likely to produce disappointing savings, and for which BPA could not fully reimburse the utility after the fact; and

- A BPA review (second set of eyes) may identify improvements to projects which otherwise would have been a lost opportunity.

Given that BPA reimburses/credits based on verified savings for custom projects, all M&V plans, except when standardized, need to be approved by BPA (for a sample of M&V plans, see Appendix C). M&V approval may mean that some projects won't go forward because the results cannot be reasonably and defensibly measured. BPA approval of the M&V plan will be BPA's commitment to reimburse/credit for verified savings at the reimbursement/credit amount that is in effect at the time of the approval, regardless of what changes may occur before the M&V is completed.

For projects with expected BPA reimbursement/credit $30,000 and above, BPA must review and provide comment. BPA is making the distinction between "Review and Comment" and "approval with a notice to proceed." BPA Review And Comment will include BPA staff comment on any weaknesses and concerns they see in a project either, for example, because of the expectation that savings won't be achieved; or because the measures may not end up being reimbursed because they are ineligible (e.g., fuel switching, or non-TRC cost-effective). BPA engineers may warn the utility about potential downsides and risks, but the utility may choose to move ahead with the project. Utilities will be reimbursed for qualifying measures based on the

actual savings up to the cost cap document by the pre-approved M&V only after the M&V is completed. A completion report will be required.

BPA reviewers may suggest alternatives to consider, identify potential lost opportunities, and make other suggestions for improvement, but they will not require the utility or consumer to change the project to meet the preferences of the reviewer.

As usual, any customer may request technical advice from BPA staff regardless of the size of the project or the requirement for Review and Comment. BPA may not be able to meet the 10 working-day standard on non-required requests due to workload and the priority that required reviews demand.

Summary

All projects for which payment is determined by the results of M&V require BPA approval of the M&V plan (commercial, industrial, agricultural, and other). Also, any M&V project with expected reimbursement/credit $30,000 or greater requires BPA Review and Comment.

In addition, regardless of the size of the project, BPA approval prior to any project implementation activity is required for:

- CVR;
- CSEI; and
- Commercial, industrial, or multifamily new construction.

Appendices

Appendix A: Administrative Costs

Appendix B: Definitions

Appendix C: Sample Measurement & Verification Plans

Appendix A – Administrative Costs

There are several issues surrounding administrative costs that BPA needs to clarify. The purpose of this write-up is to define BPA's intention, so that utilities may use the flexibility that is intended without anxiety about what is meant.

- The up to 15 percent (30 percent for small utilities under the Conservation Rate Credit (CRC)) applies to the sum of qualifying conservation expenditures. It does not apply to purchases of green power or donations, whether to the Northwest Energy Efficiency Alliance or to low-income weatherization agencies. See examples below.

- It is above and beyond the BPA "willingness to pay" parameters, (i.e., BPA assumed that 15 percent would be spent on administrative costs when setting the levels of BPA willingness to pay.)

- It is not, however, above and beyond the total CRC available for the utility and it is not above and beyond the total qualifying contract amount in the bilateral contracts. (See examples below).

- To avoid uncertainty about "what should be included in the administrative allowance," BPA is clarifying that the "up to 15 percent" administrative cost allowance (30 percent for utilities 7.5 aMW or less in the CRC) is intended to cover internal utility costs associated with the delivery of conservation, including general awareness building and general marketing (e.g., web site maintenance, efficiency messaging, generic newsletters), record keeping, reporting, help with evaluations, overhead, contribution to internal staffing or passed through to a "implementation pool" or a third part operating the utility's conservation programs. It is an allowance that is assumed to be far below the actual costs to the utility involved (risk that the allowance will exceed the actual costs is *minor).* The required state audit or CPA audits of the utility must address whether the utility has documented administrative costs related to the pursuit of conservation, and BPA will not duplicate that external review.

- All other funds reimbursed to the utility or allowed as credits against their CRC are expected to be spent on getting cost-effective measures installed.

Table A-1: Examples of Claims under CRC

Budget:	**Budget:**
$300,000	$300,000
- $100,000 spent for renewables	- $ 0 spent for renewables
- $ 50,000 spent on donations	- $ 0 spent on donations
$150,000 available for measures and qualified for 15% admin	$300,000 available for measures and qualified for 15% admin
$ 22,500 allowed for admin	$ 45,000 allowed for admin.
$127,500 additional is left to use for measures and in support of getting measures into place (WTP)	$255,000 additional is left to use for measures and in support of getting measures into place (WTP)

Table A-2: Example of Claims on the Bilateral Side

Budget (not WTP) for ESO+:	**Budget for Custom Program:** *(multifamily new construction, direct install, weatherization)*
$200,000	$200,000
$ 100,000 spent on measures over three years and in support of getting measures into place	$ 170,000 spent on measures over three years and in support of getting measures into place
$ 15,000 admin allowance	$ 30,000 admin allowance
$ 85,000 unspent that must be de-obligated	$ 0.0 unspent that must be de-obligated

Appendix B - Definitions

aMW: Average megawatt of electricity. An average measure of the total energy delivered in one year -- 8,760,000 kilowatt-hours/year.

Evaluation: At its most basic level, evaluation tests in the field the assumptions made in planning when measures are installed by real people and used by real people. It is generally not part of oversight, does not affect payments, and is used to refine or confirm the planning assumptions for future use.

BPA needs and will require cooperation with evaluations for both the CRC and the CAA to improve programs, to assure all ratepayers that we are running the most efficient programs that we can, and to show that energy efficiency is really a reliable resource.

Fiscal Year: BPA's fiscal year is from October 1 through September 30.

HSPF: Heating Season Performance Factor.

Incremental cost is a term of art that is used consistently within the Regional Technical Forum (RTF) and in this document, as well as in all California utilities. It can be the full cost of some measures, especially in retrofit situations or when a measure is completely incremental to standard practice. It is generally defined as the "energy efficiency improvement related costs above what would be required by standard practice or code." It is often called "qualifying costs of the measures."

Measurement: This refers to measurements taken to establish energy use or improvements in energy use. It can mean many things, such as testing duct leakage or measuring loading factors and run time in factories. It usually involves pre- and/or pre/post measurement. Large consumers often do it to make sure that they are getting what they pay for, or to better understand their system operations. The prevalence of required measurement for audits or for payment has varied in the field of energy efficiency, but the general rule is: the more uncertainty, the greater the risk of performance, the greater the need for actual measurement.

BPA contracts will require some level of measurement for projects for which the reimbursement is established by the savings achieved.

Oversight: This is a contract management activity that is usually limited to assuring the government that it is getting what it pays for with some level of certainty. We use this mostly for BPA activity. It will be a required part of all post-2006 conservation activities.

Those who have recently participated in BPA programs requiring oversight have reported this to be a minimal inconvenience and sometimes a constructive process. Those who haven't had recent exposure to Con Aug oversight have expressed concerns about the burdens and risks

involved. BPA will review the contract language to see if it can be simplified, but BPA cannot eliminate its right to conduct oversight visits.

PTCS®: Performance Tested Comfort Systems

Regional Technical Forum (RTF): The RTF is an advisory committee established in 1999 to develop standards to verify and evaluate conservation savings. Members of the RTF are individuals experienced in conservation program planning, implementation and evaluation and are appointed by the Northwest Power and Conservation Council.

SEER: Seasonal Energy Efficiency Ratio

Verification: This is a responsibility to inspect actual presence and proper operation of an installed measure as intended. This is a level of quality control. It is often a function performed by the utility before paying rebates. Some turn-key program operators do it to make sure that their employees are following the specs. BPA may, during an oversight visit, review measures which have been verified by the utility or a turn-key program operator.

Willingness to Pay Acronyms:

- LO – Lost opportunities are more valuable because they can't be captured later, or will cost much more to capture later.
- LML – Long measure lives represent a larger value to the region and the power system, even if the ultimate value is less certain over a longer measure life.
- CP – Customer program needs: customers have a set of traditional programs and offerings that help define their relationship with their consumers. In other cases, small utilities need a simple measure that they can offer without a lot of technical resources. In all cases, the measures are cost-effective from a total resource cost (TRC) perspective.
- MB – Market barriers represent an acknowledgement that there are substantial barriers to getting consumer attention or co-funding. Market transformation has as one of its goals trying to overcome market barriers.
- WTP – This refers to some control required to keep the overall willingness to pay within the range of the target.

Appendix C – Sample Measurement & Verification Plans

SAMPLE 1: Measurement and Verification (M&V) Plan
The purpose of the M&V plan is to provide a basis for calculating the BPA reimbursement/credit for a calculated custom measure. The M&V plan must be submitted to BPA for pre-approval, because reimbursement or credit will be determined by the outcome of the M&V. Include a detailed plan explaining how the energy savings will be verified:

Approach and Assumptions

- Outline the approach to be used and why it was chosen;
- Identify the significant variables that effect energy use and categorize each as negligible, assumed, or to be measured. Include and describe calculations to account for significant changes in production, weather, loads, hours of operation, set points, manual operation occupancy, or other factors that affect the annual savings over the expected life of the measure;
- Clearly define the baseline for the measure;
- Identify the baseline and post-installation time periods;
- Describe how energy use will be measured or calculated for both baseline and post-installation conditions. Direct measurement of pre and post energy consumption is preferred; and
- If measurement is not possible or practical, provide an explanation (e.g., direct metering is not needed for straightforward measures such as lighting retrofits. Direct metering may not be cost effective on small projects that are otherwise proven reliable.).

Metering Plan
For metered verifications, include a description of what will be measured, the measurement duration and the data sampling intervals, and the instrumentation to be used. Also include details on who will perform verification and when it will be performed. If applicable, include a one-line diagram showing proposed metering locations both before and after the installation.

Calculations
Show or describe the calculations to be used. Explain how short term measurements will be extrapolated to an annual basis.

Quality Assurance
Describe activities planned to insure good data and accurate calculations. Describe inspections, tests, commissioning, etc. to ensure that the proposed systems function as planned.

SAMPLE 2: M&V Approach for Small Projects

This is another way to view M&V for measures where energy savings from the measure(s) are expected to be small. BPA will need to work out the details.

Protocol Review by BPA
BPA may be able to develop standardized or simplified protocols that will receive only cursory review.

Utilities should keep the following information in their records for each of the simplified M&V proposals:

- Explanation of the measure including baseline and retrofit descriptions;
- Calculation methodology;
- Sources and explanation of assumptions;
- Energy savings;
- Best and worst-case energy savings;
- Planned number of units to be installed; and
- Measure life.

Application Specifications
This approach would be intended for small-scale programs or unique projects with small overall annual energy savings. The conservation measures discussed are not deemed reimbursement measures.

The measures installed under this approach should have defensible energy savings values that are based on engineering estimates using widely accepted assumptions. The engineering estimates should use assumptions from independent third party information such as evaluation reports, case studies, metering results, prototype testing, and/or scientific research.

Method Description
Primary Method
The primary method to determine savings is simple engineering calculations that use known variables specific to the project combined with assumed variables. Assumptions can come from applicable third party evaluation reports, cases studies, metering results, prototype testing, and/or scientific research. The combined possible error in the engineering estimate should not be more than 25% of the total energy savings estimate. Conservative estimates should be used whenever possible to account for the multitude of things that can be expected to go wrong with the measure and negate the savings.

Project Savings
The program savings would simply be taken as the sum of all of the measure savings.

Special Considerations

- Energy Savings Limits
  Since many of the inputs to the engineering calculation are assumed, a best case and worst-case calculation should be made. For each assumption, it is important to determine

a realistic error boundary in order to calculate the best and worst-case scenarios. In the best case calculation, all assumed variables should be those that are realistic and, when occurring together, provide the highest savings. In the worst-case calculation, the variables should provide the least amount of savings, assuming the measure hasn't completely failed, unless the potential for a failure in any individual case is probable. In the worst-case calculation, it is not uncommon to have no savings, or even negative savings.

- Documentation
  A paper trail should be made detailing original third party source of information used to determine key assumptions in the energy savings calculations. A method of the calculation should also be documented.

Recommended Tool(s)
Since the engineering calculations and site verification process will vary with the measure application, there is not one specific tool to recommend. It is recommended to use an Excel spreadsheet for engineering calculations as an easy way to document the calculation. Additionally, cells that contain assumptions pulled from third party data should have comments stating the source of the assumption.

For further information on the logic and process of M&V, please refer to PDF file, "Site Specific Verification Guidelines" at bottom of screen at the following link:
http://www.bpa.gov/Energy/N/projects/cr_discount/archive.cfm .