Ten-Year Conservation Plan
2010 – 2019

November 10, 2009

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Section 1. Cowlitz PUD Background Information

Over the next ten years, Cowlitz PUD will face changes that will move us forward in pursuing energy efficiency and require that we become more aggressive in that pursuit. These changes include:

- The Energy Independence Act (EIA), also known as I-937;
- A fully-allocated federal base system, from which the District has historically received the majority of its power;
- The method BPA will use to calculate the Contract High Water Mark (CHWM) in Fiscal Year 2010; and
- The expected increase in the cost of energy throughout the region.

Cowlitz PUD has a 17-year contract with BPA for a fixed percentage of the output from the federal base system, beginning in October 2011. The next "least-cost" energy resource, as identified in its Integrated Resource Plan (IRP), is energy conservation. Cost-effective conservation and renewable energy are expected to meet the District's load growth for the next ten years.

The Energy Independence Act (I-937) requires Cowlitz PUD to establish its ten-year cost-effective conservation resource potential by January 1, 2010, and then meet a biennial conservation target that shall be no less than its pro rata share of its ten-year potential.

WAC 194-37-070(3), in the Energy Independence Act, describes three options a qualifying utility may use to establish its ten-year conservation resource potential. Using methodologies consistent with the Northwest Power and Conservation Council's (the Council) Fifth Power Plan, the utility may either:

(a) Use the Council's conservation calculator option,
(b) Use the Council's modified conservation calculator option, or
(c) Use the utility analysis option.

Cowlitz PUD is very unique in that over three-quarters of power consumption is in the Industrial sector, with almost 90% of that from just three Pulp & Paper customers. As a result, the economic health of these three large pulp and paper mills is vitally important, not only to Cowlitz County, but also to Cowlitz PUD and its other customers.

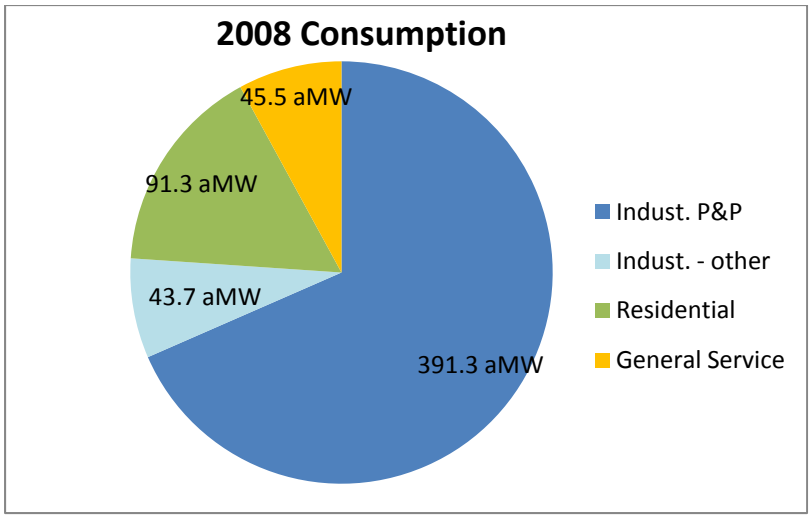

Chart 1-1

Because of its unique customer base and load profile, Cowlitz PUD opted to use Option 3 *"Utility Analysis Option"* to establish its ten-year conservation resource potential.

Section 2. Global Energy Partners, LLC (Global)

Cowlitz PUD retained an expert consulting firm, Global Energy Partners, LLC (Global) to conduct a Ten-Year Conservation Potential Assessment (CPA), using the methodology instructed by WAC 194-37-070(6) for the "utility analysis option" mentioned above.

Despite receiving bids from other experienced energy-conservation consultants, Cowlitz PUD found Global to be *uniquely* qualified to conduct its Ten-Year Conservation Potential Assessment for a couple of important reasons:

First of all, in its review of resumes of the staff members of the bidding consultants, it was clear to Cowlitz PUD that Global's staff, specifically Mr. Ed Fouche (Global's "Industrial Program Project Manager" on the CPA) was uniquely qualified for determining the conservation potential within the Industrial Sector. Mr. Fouche has over 30 years' technical and managerial work experience in industry, and broadly-recognized expertise in identifying and developing energy-efficiency opportunities in the Industrial Sector. With over 75% of its power sales to just three industrial pulp and paper customers, Cowlitz PUD saw this experience as especially valuable. Following are a few excerpts from Mr. Fouche's resume, which was included in Global's (May 23, 2008) Proposal:

> "**PROFESSIONAL EXPERIENCE (Partial List):**
> **2000 – Present, *Industrial Program Manager***
> **Global Energy Partners, LLC, Lafayette, CA**
> Mr. Fouche is responsible for managing Global's Industrial Program, a subscription-based applied research and technology transfer membership program for electric utilities that was formerly part of the Electric Power Research Institute (EPRI) R&D portfolio. Mr. Fouche has managed several national EPRI research centers that serve as predecessors to the current Industrial Program, including…the Pump, Paper, and Forest

Products Center (PPFP) at the Institute of Paper Science & Technology (IPST) in Atlanta.

1996 – 2001, Manager – Industrial Processes
EPRI (Electric Power Research Institute), Raleigh, NC
Responsible for the EPRI's FACT Office at North Carolina State University in Raleigh, the PPFP Office at IPST in Atlanta, and the CPNG Office in Houston, TX. Managed over 50 successful industrial projects in the US, Canada and Thailand to improve productivity, increase energy efficiency and reduce environmental impact.

1991 – 1996 *Manager*
EPRI Textile Office, North Carolina State University, Raleigh
Serviced the needs of electric utilities and their textile customers through the development and application of beneficial electrotechnologies (Radio Frequency/Infrared drying, Induction heating, Ultrasonic dyeing, Membrane filtration and Electrochemical/Ozone wastewater treatment.)

PUBLICATIONS (Partial List):
Power Consumption and Production Benchmarking For Three Deinking Mills (1000322) Palo Alto, CA: Electric Power Research Institute, 2000.

Impulse Drying of Paper (1000368), Palo Alto, CA: Electric Power Research Institute, 2000.

Minimizing Process Energy Use for a Large TMP Mill with Pinch Technology (1000370) Palo Alto, CA: Electric Power Research Institute, 2000.

The Efficacy of Color Removal Techniques in Textile Wastewater (TR-101900), Palo Alto, CA: Electric Power Research Institute, 1995.

AC vs. DC Drives for Textiles (BR-112211), Palo Alto, CA: Electric Power Research Institute, 1994."

Secondly, the Northwest Power and Conservation Council (NWPPC) recognizes that Global is qualified to conduct energy efficiency analyses, and has hired Global to perform studies on its behalf. For example, the NWPPC has hired Global to conduct a 2009 study titled "*Regional Economic Analysis of Residential Fuel Use; Electricity and Natural Gas."* Because adhering to "NWPPC methodology" in establishment of the conservation potential is such a key theme throughout the Energy Independence Act (WAC 194-37), Cowlitz PUD felt it was especially important to hire a consultant that is also recognized by the NWPPC as being 'qualified.'

Section 3. General Approach and Timeframe of CPA Study

Global spent over one year in development of the Ten-Year Conservation Potential Assessment for Cowlitz PUD. The first "kickoff meeting" between Global and Cowlitz PUD was held on July 28, 2008. Global delivered the final comprehensive CPA report on August 7, 2009.

As might be expected, Global collected and analyzed reams of data on the costs, energy savings, and market penetration (within Cowlitz PUD service territory) of a universe of conservation measures.

In addition, Global enhanced its study with a very-focused effort on the three large industrial pulp and paper customers that comprise some 75% of the load within Cowlitz PUD. First, Global conducted two-hour phone interviews with key personnel at each of the three large pulp and paper mills to learn about the mill configurations, operating practices, and management decision-making processes and criteria. Global then followed up the phone interview by coming to Longview and spending a day at each of the three mills, touring mill facilities and meeting with key mill personnel to discuss long-range conservation opportunities.

Section 4. Step-by-Step Adherence to NWPCC Methodology

The Council's analytical methodology for establishing the conservation resource potential is outlined in WAC 194-37-070(6)(a), (i) through (xv). Each of the fifteen procedures is included below as excerpted from the WAC. Following each procedure is a description of how Global complied with the procedure (as described in an attachment to a Global August 7, 2009 email to Cowlitz PUD), and where the results can be found in the August 7, 2009 comprehensive CPA Report labeled "Conservation Resource Potential Study: Cowlitz Public Utility District No. 1."

WAC 194-37-070(6)(a) Documenting development of conservation targets – Utility analysis option.

The NWPCC's analytical methodology for establishing the conservation resource potential and conservation targets for the Northwest power system is outlined in procedures (a) (i) through (xv) of this subsection. A utility that chooses this option will document that it established a ten-year potential using an analytical methodology consistent with these NWPPC procedures (a) (i) through (sv) of this subsection:

(i) Analyze a broad range of energy efficiency measures considered technically feasible;

For the pulp and paper customers, Global identified specific energy efficiency improvement projects by way of site visits conducted in the fall of 2008.

For the residential and commercial sectors, Global began with "universal" lists of energy efficiency measures (EEMs). These extensive lists include all the EEMs contained within the Regional Technical Forum's (RTF's) database of EEMs. The residential universal list contains 121 EEMs, while the commercial list contains 179.

These lists were reduced to include only technically feasible EEMs by means of a qualitative screening process to remove EEMs that are inappropriate for the District's service territory for reasons of technical or other applicability.

- Chapter 5, Sections 5.1 and 5.2 describe the process of identifying and screening for applicable EEMs.

(ii) Perform a life-cycle cost analysis of measures or programs, including the incremental savings and incremental costs of measures and replacement measures where resources or measures have different measure lifetimes;

Global performed life-cycle cost analyses using a total resource cost methodology for each industrial project and each residential and commercial EEM. These analyses assumed that equipment would be replaced upon failure; therefore, incremental costs and savings were used. The life-cycle cost analyses include equipment purchase, installation, and O&M costs. It does not include salvage costs, as the analyses assume that the old equipment will have no value upon failure.

- Chapter 2.5 describes in detail the life-cycle cost analyses.

(iii) Set avoided costs equal to a forecast of regional market prices, which represents the cost of the next increment of available and reliable power supply available to the utility for the life of the energy efficiency measures to which it is compared;

Cowlitz PUD set the price at an avoided cost that is "cost-effective" per the definition in RCW 80.52.030.(7) and referenced in the Energy Independence Act I-937.

- Chapter 7 includes information on the conservation supply curves.

(iv) Calculate the value of the energy saved based on when it is saved. In performing this calculation, use time differentiated avoided costs to conduct the analysis that determines the financial value of energy saved through conservation;

The District's avoided costs are not time-differentiated. Therefore, the energy savings impacts of each EEM are averaged over the year. In addition, the high load factors of the three large pulp and paper mills and their importance in the District's achievable conservation potential reduce the importance of time-differentiated rates.

(v) Conduct a total resource cost analysis that assesses all costs and all benefits of conservation measures regardless of who pays the costs or receives the benefits. The NWPCC identifies conservation measures

that pass the total resource cost test as economically achievable;

Global performed life-cycle cost analyses using a total resource cost methodology for each industrial project and each residential and commercial EEM.

- Chapter 2.5 describes in detail the total resource cost analyses.

(vi) Identify conservation measures that pass the total resource cost test, by having a benefit/cost ratio of one or greater as economically achievable;

The spreadsheets containing the respective cost-effectiveness models include the benefit/cost ratio for each EEM based on the total resource cost test. The cost-effectiveness of individual EEMs is dependent upon the District's incentive as a percentage of the incremental cost of the EEM.

- The conservation potential spreadsheets for each sector embedded in Appendix F of the comprehensive CPA Report include the benefit/cost ratios for each EEM in the columns indicated:
  - Industrial – column "AB"
  - Residential – column "AH"
  - Commercial – column "AR"

(vii) Include the increase or decrease in annual or periodic operations and maintenance costs due to conservation measures;

The incremental O&M impacts of each EEM are included in the benefit/cost and levelized cost analyses for the residential and commercial sectors. The industrial sector energy efficiency projects are too site-specific to estimate the individual O&M impacts. Additionally, the industrial O&M impacts would be a very small component of the value of energy saved.

- The conservation potential spreadsheets for the residential and commercial sectors embedded in Appendix F of the comprehensive CPA report include the incremental O&M for each EEM in the columns indicated:
  - Residential – column "AB"
  - Commercial – column "AM"

(viii) Include deferred capacity expansion benefits for transmission and distribution systems in its cost-effectiveness analysis;

Many of the District's residential and commercial EEMs come from the planning, tracking, and reporting system database managed by the Regional Technical Forum (RTF). Others come from the Database of Energy Efficiency Measures (DEEM) owned by Global Energy Partners, LLC. The levelized cost characteristics of each EEM, regardless of source, include deferred capacity expansion benefits for transmission and distribution systems.

- The conservation potential spreadsheets for each sector embedded in Appendix F or the comprehensive CPA Report include the levelized cost for each EEM in the columns indicated:
  - Industrial – column "AA"
  - Residential – columns "AD" and "AF"
  - Commercial – columns "AN" and "AP"

(ix) Include all nonpower benefits that a resource or measure may provide that can be quantified and monetized;

The quantifiable nonpower benefit included in the analyses is the value of carbon dioxide offset by conservation. A carbon dioxide offset value of $27/MWh[1] conserved was used in the benefit/cost analyses for each EEM. This value is included in the levelized cost for each EEM in the columns indicated:

- Industrial – column "AA"
- Residential – columns "AD" and "AF"
- Commercial – columns "AN" and "AP"

(x) Include an estimate of program administrative costs;

Estimated program administrative costs for the residential ($0.1591/kWh) and commercial ($0.0946/kWh) sectors are included in the benefit/cost ration of each EEM. The estimated program administrative costs for the industrial sector are negligible on a per-kWh saved basis. This is because the industrial energy efficiency effort consists of individual projects, resulting in low overhead combined with large savings.

- The conservation potential spreadsheets for the residential and commercial sectors embedded in Appendix F of the report include the estimated program administrative costs for each EEM in the columns indicated:
  - Residential – column "BI"
  - Commercial – columns "CC" and "CP"

(xi) Discount future costs and benefits at a discount rate based on a weighted, after-tax, cost of capital for utilities and their customers for the measure lifetime;

The discount rate used in the analyses was 4.75%. This rate was used in the levelized cost calculations for all three sectors and to discount future electric and O&M cost to the present.

- The conservation potential spreadsheets for each sector embedded in Appendix F or the comprehensive CPA report include the levelized cost for each EEM in the columns indicated:
  - Industrial – column "AA"
  - Residential – columns "AD" and "AF"

[1] Conservation Rate Credit (CRC) and Conservation Acquisition Agreement (CAA) Implementation Manual. Footnote 1, page 140, Bonneville Power Administration, April 1, 2009.

- Commercial – columns “AN” and “AP”

- The conservation potential spreadsheets for the residential and commercial sectors embedded in Appendix F of the comprehensive CPA report also include worksheets where the net present value (NPV) factors are listed in tabular format.

(xii) Include estimates of the achievable customer conservation penetration rates for retrofit measures and for lost opportunity (long-lived) measures. The NWPCC’s twenty-year achievable penetration rates, for use when a utility assesses its twenty-year potential, are eighty-five percent for retrofit measures and sixty-five percent for lost opportunity measures achieved through a mix of utility programs and local, state and federal codes and standards. The NWPCC’s ten-year achievable penetration rates, for use when a utility assesses its ten-year potential, are sixty-four percent for nonlost opportunity measures and twenty-three percent for lost-opportunity measures; the weighted average of the two is a forty-six percent ten-year achievable penetration rate;

The Council used the ten-year achievable penetration rates to estimate the achievable potential for each sector. The annual figures were adapted from Figure 4, “Achievable Savings: A Retrospective Look at the Northwest Power and Conservation Council’s Conservation Planning Assumptions,” August 2007, Council document 2007-13.

- Chapter 2.5 describes in detail how the achievable conservation potential was calculated for each sector. In particular, Table 2-1 lists the cumulative market penetration values adapted from Figure 4 of Council document 2007-13.

(xiii) Include a ten percent bonus for conservation measures as defined in 16 U.S.C. § 839a of the Pacific Northwest Electric Power Planning and Conservation Act;

The 10% bonus applies to the District’s avoided cost rather than the individual EEMs. Cowlitz PUD has added 10% to this value for identifying ‘cost-effective’ measures from the potential curves developed by Global to satisfy this requirement.

(xiv) Analyze the results of multiple scenarios. This includes testing scenarios that accelerate the rate of conservation acquisition in the earlier years; and

The achievable potential in the industrial sector is fixed over the 10-year period since the energy efficiency projects were identified individually through on-site assessments. Therefore, “front loading” the projects in the early years has no effect on the overall achievable potential.

The first year penetration rate for the residential sector retrofit market was doubled from 6% to 12% while maintaining the linear ramp rate to 64% in year 10. The resulting increase in the 10-year achievable potential was 9%. Tripling the rate to 18% produced an increase of 17%.

The first year penetration rate for the residential sector lost opportunity market was doubled from 1% to 2% while maintaining the nearly linear ramp rate to 23% in year 10. The resulting increase in the 10-year achievable potential was less that 1%. Tripling the rate to 3% produced an increase of 13%.

The first year penetration rate for the commercial sector retrofit market was doubled from 6% to 12% while maintaining the linear ramp rate to 64% in year 10. The resulting increase in the 10-year achievable potential was 9%. Tripling the rate to 18% produced an increase of 18%.

The first year penetration rate for the commercial sector lost opportunity market was doubled from 1% to 2% while maintaining the nearly linear ramp rate to 23% in year 10. There was no resulting increase in the 10-year achievable potential. Tripling the rate to 3% produced an increase of 12%.

- The conservation potential spreadsheets for the residential and commercial sectors embedded in Appendix F of the report include the impacts of the sensitivity analysis in the ranges of cells indicated:
  - Residential – cell ranges BI131:BJ133 on sheets "Res-Single-Exist," "Res-Multi-Exist," "Res-Single-New," and "Res-Multi-New"
  - Commercial – cell ranges CB192:CC194 and CN192:CO194 on sheet "Commercial"

(xv) Analyze the costs of estimated future environmental externalities in the multiple scenarios that estimate costs and risks.

The carbon dioxide offset value was reduced to $0 MWh conserved for all three sectors. This would minimize the benefits of conservation with regard to carbon dioxide emissions. In the industrial and residential sectors, there were no changes in the number of cost-effective EEMs. Therefore, there would be no reduction in the achievable potential of those two sectors. In the commercial sector, two EEMs were no longer cost-effective, reducing the achievable potential by two percent.

- The conservation potential spreadsheets for each sector embedded in Appendix F of the report include the benefit/cost ratios for each EEM in the columns indicated:
  - Industrial – column "AB"
  - Residential – column "AH"
  - Commercial – column "AR"

Section 5. Ten Year (2010-2019) Conservation Potential and first Biennial (2010-2011) Conservation Target

Per the Global Conservation Potential Study (utilizing Option 3 – *Utility Analysis Option*), Cowlitz PUD's achievable ten-year conservation potential is 231,676 MWh's (26.5 aMW). The two-year target savings is 46,335 MWh's (5.29 aMW).

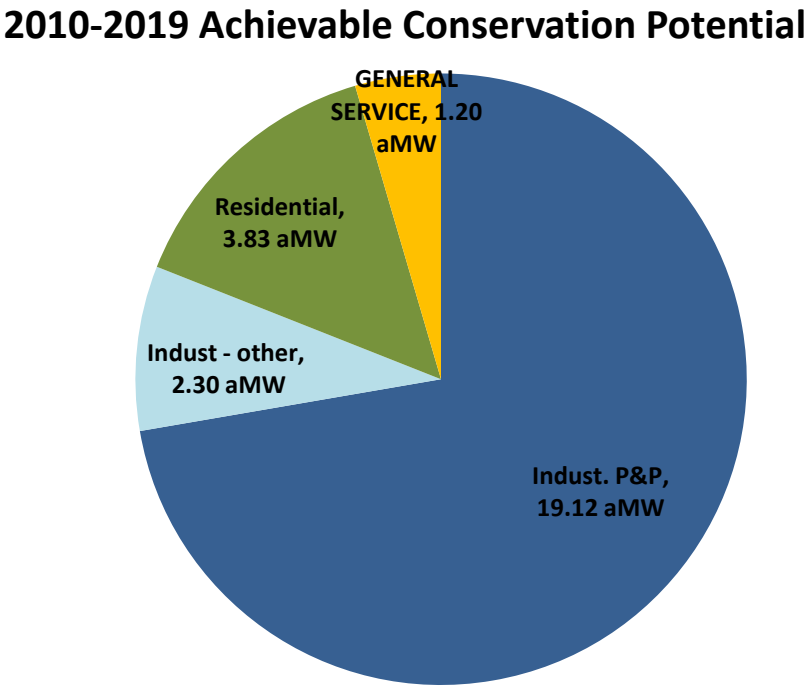

Chart 5-1

Section 6. Sector Overview

Industrial Sector

As mentioned previously, our Conservation Resource Potential Study conducted by Global Energy Partners, reveals the greatest potential for energy savings for the District being in our industrial sector. The cumulative cost-effective achievable potential established for the industrial sector as a whole by the year 2019, is 187,655 MWh (21.42 aMW), which includes three pulp and paper mills. While motors and drives are the largest end-use, process-related end-uses are where the greatest potential lies.

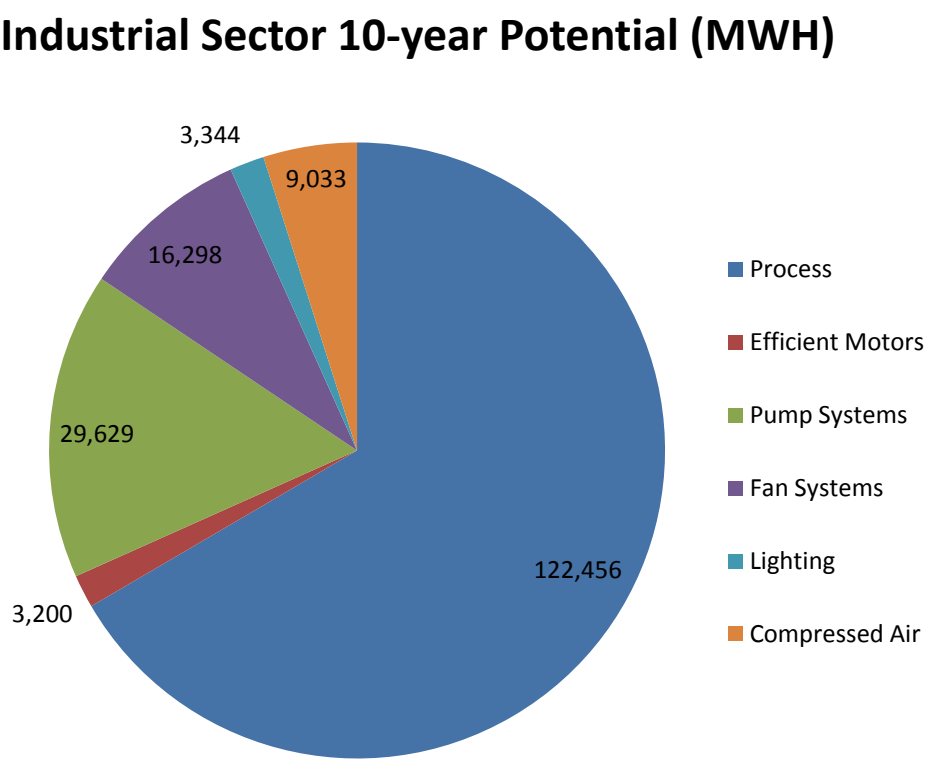

Chart 6-1

Residential Sector

The District's residential sector is the next greatest opportunity for energy savings after the industrial sector. By the end of 2019, the cumulative cost-effective achievable potential in the residential sector is 33,507 MWh (3.83 aMW). Appliances, building envelopes and HVAC are the end-uses where the most potential lies. The energy efficiency measures with the greatest energy savings impacts are ENERGY STAR refrigerators and freezers, duct repair and sealing, and removal of second refrigerators and freezers.

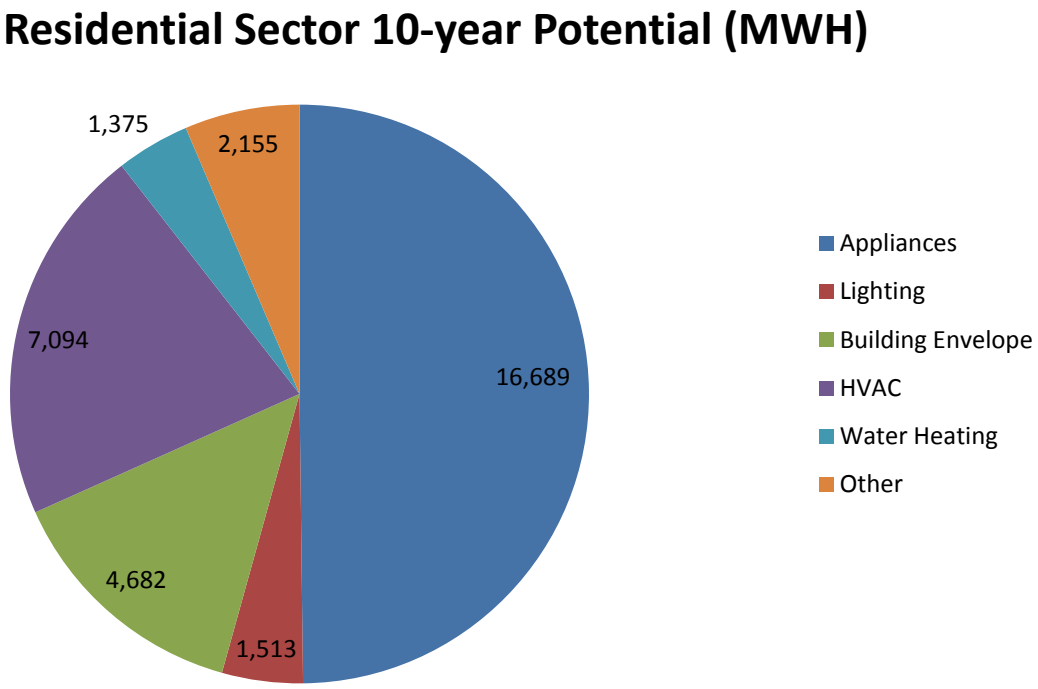

Chart 6-2

General Service (Commercial) Sector

The District's cumulative cost-effective achievable energy savings is estimated to be 10,514 MWh (1.2 aMW). Lighting is by far the end-use where the most potential lies. HVAC, cooking and water heating represent other top end-uses for achievable potential. The energy efficiency measures with the greatest energy savings impacts are fluorescent T8 and T5 lamps and fixtures.

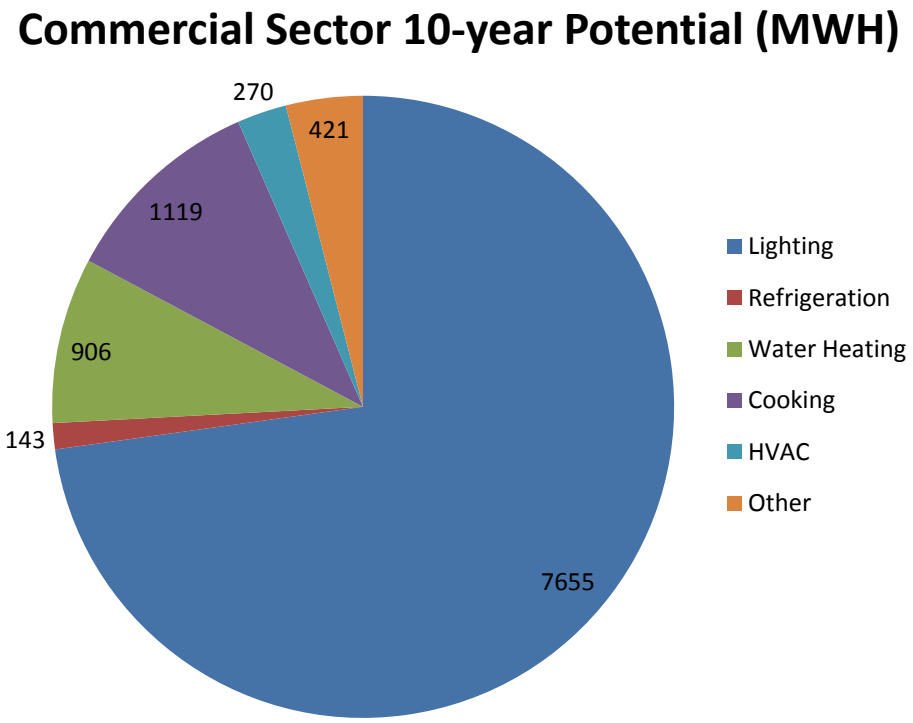

Chart 6-3

Section 7. Conservation Funding

Each year, the District will establish an annual budget for the next year's conservation activities and allocate funds for each sector. At the end of each year, based on conservation achievements for the previous year, a new budget will be established for the coming year, which will be geared toward meeting our annual target of 2.65 aMW. It is difficult to establish actual expenditures and KWh savings up front by sector because of unknown factors that affect actual participation levels, i.e. local economy, projected completion of measures for large industrial projects, customer participation, rates, etc. Actual participation levels will vary from year to year, customer sector by customer sector, and measure by measure.

The largest portion of our annual budget will be devoted to implementing energy efficiency measures in the industrial sector, since this is where 75-80% of our load is located, and obviously the greatest potential for energy savings.

Table 7.1
2010 Annual Conservation Budget

Residential Conservation	$ 793,200
Commercial Conservation	$ 528,800
Industrial Conservation	$ 3,966,000
Conservation Program Administrative OH And Capital Costs	$ 742,320
Total Conservation Budget	**$ 6,030,320**

(Note: $5,288,000 is customer incentives, which will provide an estimated 2.65 aMW at $1.98M/aMW)

Section 8. Marketing Approach

The District plans to provide a broad marketing campaign and advertise its conservation programs through a variety of resources, including monthly newsletters, television, radio, newspaper, web page, brochures, home shows, Earth Day events, customer meetings, etc.