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**2008 – 2012**

**ACTION PLAN**

**CONSERVATION RESOURCES DIVISION**

**Seattle City Light**

*Building a World-Class Conservation Power Plant:  
One Customer at a Time*

September 16, 2008

Note: final draft is subject to change with public comment and City Council budget process

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## *Executive Summary*

Seattle City Light has a long tradition of environmental stewardship; this plan underscores our intention to continue this commitment by *increasing* our investment in cost-effective energy efficiency over the coming five years.

This investment is a key component of Mayor's climate change initiative and continues with Seattle City Light's commitment to Greenhouse Gas neutrality.

The number of issues driving the development this plan is many, ranging from climate change and global warming to energy security and economic development. Our response is equally diverse, including a comprehensive suite of programs to capture energy resources through conservation, demand response, and renewable energy that will provide tangible benefits to all of our customers.

Our goal with this plan is *to meet most of City Light's projected load growth through 2012*. This goal, totaling 65.5 aMW is aggressive and will require a substantial increase over current levels of investment. Additionally, meeting these goals will require commitment -- including both financial and institutional commitment. The annual energy savings goals and direct budget requested are summarized in the table below. These energy savings are consistent with City Light's 2008 Integrated Resource Plan (IRP), which details how the City will meet load growth and obtain additional generation resources over the next 20 years.

*Addressing climate change, energy security, and economic development*

*Meeting most of load growth through 2012*

Five Year Plan			
Year	aMW <sup>1</sup>	MWhs <sup>2</sup>	\$ Million <sup>3</sup>
2007	7.25	63,510	\$20.19
2008	8.4	73,804	\$25.03
2009	12.2	180,521	\$41.94
2010	14.5	307,070	\$46.13
2011	15.1	439,561	\$50.17
2012	15.3	573,807	\$51.33
<b>2008-2012 TOTAL</b>	<b>65.5</b>	<b>573,807</b>	<b>\$214.60</b>

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<sup>1</sup> 1 average MW (aMW) = 8760 megawatt-hours (MWhs). The aMW unit is a unique measure often used in the hydroelectric-based Northwest. These numbers represent the total new aMW of conservation achieved in each year.

<sup>2</sup> Starting in 2008, MWh savings are cumulative. For example, 2008 represents savings from only 2008, 2009 represents savings from 2008 and 2009, 2010 represents savings from '08, '09 and '10, etc.

<sup>3</sup> These figures represent Seattle City Light's Net Costs for the Five-Year Plan. These figures include all program related costs, employee salaries, labor loadings, administrative and general expenses, offsetting revenue from outside parties, and loan repayments. Full costs are broken down in Appendix F.

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However, with this commitment, we expect that the citizens of Seattle will receive approximately \$121 Million in benefits over the lifetime of this investment. Participating customers will receive nearly \$169 million in net benefits, after they have paid for their share of the conservation investments. Nearly one million metric tons of carbon dioxide are avoided through 2012 from the energy conservation savings acquired from 2008 through 2012. By keeping energy dollars in the local economy, these conservation investments are expected to support six to twelve full-time employees per \$1 million spent and create from 400 to 800 additional jobs, based on both local and national studies looking at the relationship between energy efficiency and job creation.

In addition to being a key initiative of the Mayor's Climate Action efforts, this plan is consistent with several other key energy initiatives, particularly: the recommendation of the 2008 Integrated Resource Plan; City of Seattle's 2006 Climate Action Plan and the Mayor's Green Building Capital Initiative; the Northwest Power and Conservation Council's Fifth Power Plan (2005); and the Kyoto Protocols. Moreover, the actions outlined in the plan are expected to significantly exceed the requirements of Washington State Initiative-937.

*Plan includes investments in core delivery infrastructure*

The plan has four key themes or elements:

- Rebuild the conservation infrastructure;
- Expand existing programs;
- Develop new programs; and
- Incorporate customer-side renewables and demand response.

The effort to rebuild our core infrastructure focuses in several key areas: information systems, monitoring and verification, planning, and evaluation. Our ability to successfully deliver and improve our current programs, while continuing to develop effective, creative future initiatives, depends upon these investments. Included in the Plan's new initiatives are both energy conservation programs and other power-related activities on the customer side of the meter, including support for small-scale renewables and pilot efforts to explore options for demand response.

As outlined in this plan, we propose to:

- Expand on City Light's existing commercial, industrial, residential renewable energy, multi-use and other programs.
- Create 16 new programs to provide incentives, technical assistance, educational support and demonstration models.
- Redesign the program's organizational structure.
- Revitalize current staff positions and add 28 new full-time positions, for a total of 91 full-time.
- Internalize succession planning in order to transfer our significant institutional memory to a new generation who will lead City Light into the future.
- Add a Monitoring and Verification function.
- Increase our capabilities in long-term planning and evaluation.
- Develop a professional marketing team to present and "sell" our programs to our customers

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- Update our information management capabilities.
  - Expand the program's commitment to support all constituencies, including low-income customers
  - Support existing and new partnerships in the city, state, region and nation.

This plan represents the culmination of countless hours of work by City Light staff and includes detailed information on the programmatic and organizational initiatives that are planned for implementation over the coming five years. We have provided the background and rationale for these initiatives, as well as detailed information regarding the economic benefits of these initiatives. Supporting documentation is also provided in the accompanying appendices.

We appreciate and welcome the continued support of city and county leaders, all citizens and businesses, our trade allies, and other strategic partners as we move forward with the initiatives outlined in this Plan.

## ***Acknowledgements***

The opportunity to develop a comprehensive and important plan such as this only comes along very rarely in one's career. We wish to acknowledge the many parties who have played a role in crafting the vision and the detail underlying this Plan. Key stakeholders have included the many City Light customers and trade allies that have participated in research to understand energy efficiency needs in the marketplace; the Northwest Energy Coalition; the Northwest Energy Efficiency Council, the Bonneville Power Administration; and the Northwest Energy Efficiency Alliance. City Light Staff from several other Divisions have also played a key role in guiding the development of this plan, including representatives from Finance, Human Resources, Communication & Public Affairs, and the Account Executive Office. Energy Market Innovations, Inc. and its staff, the primary consultants on this project, have provided consistent project leadership along with their technical, market, and organizational guidance throughout this process. And finally, none of this work would have been possible without the diligent and thorough work completed by staff of the Conservation Resources Division while, at the same time, continuing to work their day jobs to provide the City of Seattle with its reliable conservation resource. Steve Lush, Ayreen Calimquim, Mike Little, Greg Whiting, and Glenn Atwood made particularly significant contributions.

Robert M. Balzar,  
Director, Conservation Resources Division

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# 1. INTRODUCTION

Welcome to Seattle City Light's *Five-year Conservation Action Plan* for the period 2008-2012.

Since 1977, Seattle City Light (City Light) has given its customers energy efficiency services. The results of these efforts have been significant, delivering a cost-effective energy resource for the utility; reducing residential, commercial and industrial customers' bills; and avoiding greenhouse gas emissions and other environmental impacts of energy production.

Seattle and the surrounding area continue to attract vibrant economic growth and development, guided in part by state and local policies intended to concentrate growth in urban areas. This plan presents a green, climate-friendly option for meeting the community's near-term energy needs cost-effectively, while delivering long-term, customer and environmental benefits. It complements the City of Seattle's *2006 Climate Action Plan* and recommends conservation savings path, including detailed budgets, proposed savings targets, program content and organizational requirements -- to exceed recent accomplishments.

In September 2007 Seattle Mayor Greg Nickels launched Seattle Climate Action Now (SCAN), a grassroots campaign to encourage everyone in Seattle to reduce pollution that causes global warming at home, on the road and in neighborhoods. SCAN identified one direct and effective way to reduce global warming pollution: increase energy efficiency and conservation savings. During 2008 the Mayor announced his Green Building Capital Initiative and has since convened a Task Force to review policy options aimed at achieving a 20% reduction in energy consumption in existing residential and commercial buildings and in meeting the 2030 Challenge for new buildings. The Plan directly supports these goals, and for electricity efficiency establishes a base upon which the other policies can build.



Finally, City Light's 2006 Integrated Resource Plan found that accelerated levels of conservation above the existing goal of 7.25 aMW were cost-effective. The Plan recommended study of accelerated levels of conservation. Informed by work done to develop the Conservation Five Year Plan, the recently adopted 2008 Integrated Resource Plan recommends accelerating conservation to levels consistent with the Plan.

## 1.1 Plan Organization

This plan is organized into five sections:

- **Section 1: Introduction**
- **Section 2: Conservation as a Resource** -- An overview of City Light's impressive past energy efficiency efforts, and detailed information about additional conservation potential
- **Section 3: Envisioning a World-Class Conservation Utility** -- The vision for City Light's future and current policy that will impact the utility's energy conservation program efforts

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- **Section 4: 2008-2012 Programs and Expected Results** -- A detailed overview of planned programs and budgets, including core programs, expanded core programs and new initiatives
  - **Section 5: Rebuilding the Seattle City Light Infrastructure** -- A description of the important human resource competencies required to the success of this plan
  - **Section 6: Summary of Action Items** -- A summary of this proposed plan, and specific action items and plans for public review and comment.

## 1.2 Recommended Five Year Plan: Accelerated Savings and Benefits

The Conservation Resources Division (CRD) of City Light recommends that City Light pursue this Five Year Plan, which the division developed between December 2006 and June 2008. The plan integrates information and recommendations from the following:

- *City of Seattle 2006 Climate Action Plan*
- *Conservation Potential Assessment* (Quantec, October 13, 2006)
- *2006 Seattle City Light Integrated Resource Plan, City Council recommendation*
- *Current State Assessment, Energy Market Innovations* (June 1, 2007)
- *Hidden Dragon efforts July-Oct 2007* (Conservation Resources Division)
- *2008 Seattle City Light Integrated Resource Plan*

The recommended path will return City Light as a national leader for its innovative and effective energy conservation programs, in particular by meeting most of the utility's planned load growth with conservation as the first-choice resource. As shown in **Table 1**, City Light will achieve efficiency gains equal to one percent of total retail sales and nearly all of the utility's expected load growth by 2010. This equates to over 125,000 megawatt-hours (MWhs) or 14.5 average megawatts (aMW) by 2010, a 100 percent increase from 2007, and reaches 15.3 aMW in 2012.

***With this plan,  
City Light Expects  
to double its  
annual  
conservation  
resource.***



**Table 1 : Five Year Plan - Goals and Budgets**

Five Year Plan			
Year	aMW <sup>4</sup>	MWhs <sup>5</sup>	\$ Million <sup>6</sup>
2007	7.25	63,510	\$20.19
2008	8.4	73,804	\$25.03
2009	12.2	180,521	\$41.94
2010	14.5	307,070	\$46.13
2011	15.1	439,561	\$50.17
2012	15.3	573,807	\$51.33
<b>2008-2012 CUMMULATIVE TOTAL</b>	<b>65.5</b>	<b>573,807</b>	<b>\$214.60</b>

The aggressive energy savings goals of the Five Year Plan provide a cost-effective energy resource consistent with the accelerated path recommended by the 2008 Integrated Resource Plan. Significantly, the Five Year Plan also aligns directly with the City of Seattle's *2006 Climate Action Plan* by greatly enhancing energy efficiency efforts in the residential and other sectors. Achieving the energy efficiency goals is necessary to continue the City's momentum toward carbon neutrality.

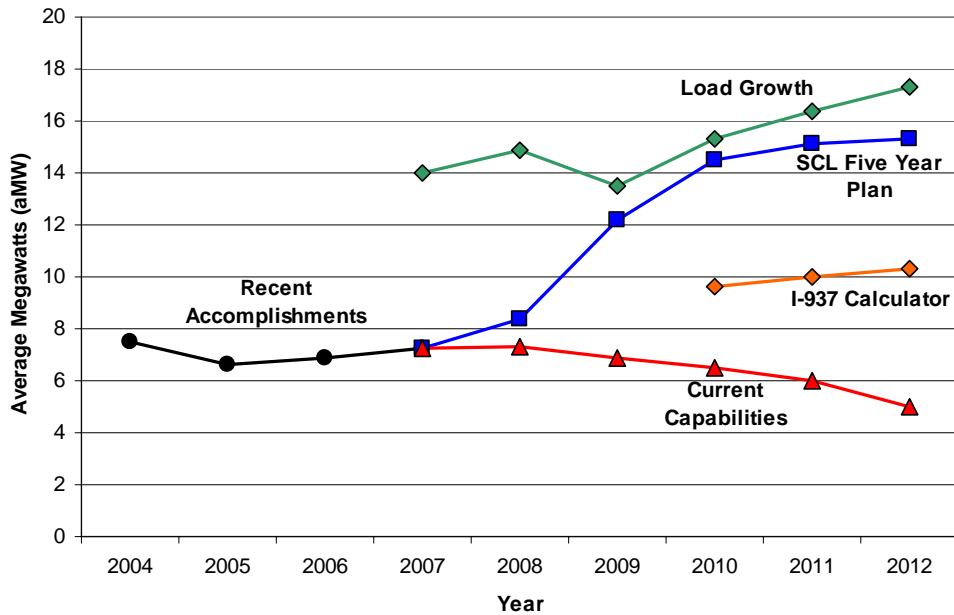
To achieve these impressive goals, the program must ramp up significantly in *2009, with associated increases in staffing, contractor support and investment by Seattle City Light*. Moving forward on this path allows City Light's Conservation Resources Division to regain core competencies in planning and evaluation; develop new core competencies in marketing and contract management; institute independent Measurement and Verification oversight; and strengthen already strong core competencies in program delivery, energy analysis and documentation.

**Figure 1** shows the relationship between recent energy savings accomplishments, the Five Year Plan, and expected load growth. Also included are City Light's possible conservation requirements under Washington State I-937, as estimated by the Northwest Power and Conservation Council's Utility Conservation Target Calculator. (See section 3.3 for additional discussion regarding I-937's conservation requirements.)

<sup>4</sup> 1 average MW (aMW) = 8760 megawatt-hours (MWhs). The aMW unit is a unique measure often used in the hydroelectric-based Northwest. These numbers represent the total new aMW of conservation achieved in each year.

<sup>5</sup> Starting in 2008, MWh savings are cumulative. For example, 2008 represents savings from only 2008, 2009 represents savings from 2008 and 2009, 2010 represents savings from '08, '09 and '10, etc.

<sup>6</sup> These figures represent Seattle City Light's Net Costs for the Five-Year Plan. These figures include all program related costs, employee salaries, labor loadings, administrative and general expenses, offsetting revenue from outside parties, and loan repayments. Full costs are broken down in Appendix F.



**Figure 1: Five Year Plan vs. Load Growth**

Table 2 on the following page summarizes the economic analysis of the Five Year Plan using the Portfolio Pro model licensed from Cadmus and standard financial assumptions endorsed by City Light's Financial Planning staff<sup>7</sup>. The primary perspective of interest is the Total Resource Cost (or Service Territory) perspective, which takes into consideration the benefits and costs of the entire service territory, including customers. Under this perspective, the benefit/cost ratio is 1.34 with associated net benefits of positive \$120.7 million (2008 real dollars). The levelized cost to the Service Territory is \$0.056 per kWh, which is below the \$0.06 per kWh threshold established in the 2006 Integrated Resource Plan. Alternatively, the levelized cost to the utility (from the program perspective) of the energy savings is \$0.032 per kWh.

This plan makes does not include the inherent benefits of future carbon tax or "cap and trade" allowance that result from energy use avoided through conservation initiatives developed and implemented as a result of this plan. If we assume a conservative value of \$5 per metric ton of CO<sub>2</sub> as the future cost of any "carbon policy" compliance, the benefits of this plan are underestimated by almost \$5 million (\$5 per ton times 1,655,000 cumulative MWhs times 0.6 tons per MWhr)

The draft Business Case in **Appendix C** provides a more detailed economic analysis of the Five Year Plan.

<sup>7</sup> These are documented in Appendix C.

<b>Utility Program Perspective</b>		Dollars in Millions
Avoided Power (Benefit to Utility)		\$472.2
Program Costs (Costs to Utility)		(\$198.1)
Net Benefit to Utility		<b>\$274.1</b>
Utility Benefit/Cost Ratio		<b>2.38</b>
<b>Participating Customer Perspective</b>		
Customer Bill Savings (Benefit to Customer)		\$309.9
Customer Conservation Cost (Cost to Customer)		(\$140.6)
Net Benefits to Customer		<b>\$169.3</b>
Customer Benefit/Cost Ratio		<b>2.20</b>
<b>Service Territory Perspective (Total Resource Cost)</b>		
Avoided Power (Benefit to Service Territory)		\$472.2
Total Costs (Utility + Customer Conservation)		(\$351.5)
Net Benefit to Service Territory		<b>\$120.7</b>
Service Territory Benefit/Cost Ratio		<b>1.34</b>

**Table 2: Economics of Five Year Plan  
30 Year Analysis – 2008\$ (NPV)**

Appendix D provides a detailed explanation of the economic framework and a description of the various economic perspectives considered.

### 1.3 New and Expanded Programs

City Light has developed programs for commercial, industrial and residential customers to accomplish this aggressive plan.<sup>8</sup> These programs continue and enhance City Light's existing mix of programs in response to changing customer needs, market conditions, technology considerations, and policy drivers. In addition to sector-specific programs, City Light will offer incentives for renewable energy efforts and enable mixed-use development to take advantage of efficiency incentives. City Light will support several other efficiency-related activities, such as a demand response program; financing options for both public and private-sector customers (the latter likely modeled after the Clinton Climate Initiative); and city and regional initiatives.

*This Plan includes enhancements to existing programs, plus a suite of new initiatives.*

#### **Commercial Programs**

City Light will continue and expand current programs targeted at commercial customers to provide increased energy savings potential. New programs will be offered including new construction design consultation for energy efficiency practices such as whole-building analysis, incentives for on-site energy managers, delivery of design and technology based services to increase energy efficiency of data centers, and sector-specific programs, such as those targeting schools and groceries.

<sup>8</sup> Section 4 provides more complete program descriptions and associated budget and savings data.

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## **Industrial Programs**

The current Energy Smart Services for industrial customers will be expanded to better serve the target market. In addition, City Light will offer rebates on simple compressors for small and medium sized industrial businesses.

## **Residential Programs**

City Light will enhance existing programs for single-family and multifamily residential customers. For example, City Light will maximize its efforts to encourage purchase and use of CFLs. It will also expand current incentives to residential customers for appliances, lighting, weatherization and construction, and consider additional incentives for single-family new construction and new measures, such as water heaters and space heaters. The utility will collaborate with "big box" stores to augment delivery of City Light residential programs and will explore options to enable customers to better monitor and analyze energy use and potential savings in their homes.

## **Mixed-use Programs**

A new program will be developed by City Light to offer mixed-use developers new construction incentives for energy-efficient measures, such as windows, lighting, appliances and HVAC systems.

*For Completeness of the Conservation Resources Division Five Year Action Plan, Renewable and Other programs are included with budget and staffing requirements, and their costs are included in the economic analysis of the Plan at the portfolio level, but they do not contribute directly to energy savings or production goals.*

## **Renewable Energy Programs**

City Light will expand the *Green Up* program into the residential and commercial sectors and its delivery of the Washington State Renewable Tax Incentive program. City Light will also explore additional incentive programs to increase customers' installation and use of renewable energy systems.

## **Other Programs and Initiatives**

Under the new plan, City Light will add other programs that are not sector-specific. These include:

- Development of demand response initiatives for commercial and residential customers
- On-bill financing to support customer participation in energy efficiency programs
- Support of regional and City initiatives, including the Lighting Design Lab, the Northwest Energy Efficiency Alliance and the Seattle Energy Code.

- 
- Develop a specific program to implement and track City Light infrastructure energy efficiency opportunities.

## 1.4 Organizational Development

To meet the challenge of providing a sound foundation of efficient, reliable, affordable and green energy for the future, City Light must address several significant organizational challenges in support of the three themes identified in section 5.6: rebuilding core competencies; expanding existing programs; and developing and implementing new programs. Specific actions, detailed in **Section 6**, include:

- Increase budget authorization to:
  - \$35,810,000 in 2009
  - \$40,180,000 in 2010
- Increase staffing by 28 professionals (23 in 2009 and five in 2010), to 91 FTEs.
  - Twelve program delivery positions
  - Eleven planning and evaluation staff positions
  - Two new marketing staff positions
  - One new manager and two new supervisors
  - Acquire office space, computers and other tools and supplies for the increased staff.
- Establish job titles and associated descriptions, and upgrade salaries to meet regional standards and market conditions
  - Adapt Account Executive position as *Business Solutions and Account Manager position to deliver new program initiatives relying primarily on outside contractors.*
- Continue and expand using external contracts to deliver conservation programs
  - Staff management of outside contracts
  - No displacement of existing staff

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## 2. CONSERVATION AS A RESOURCE

City Light has a long and rich history of commitment to energy efficiency. The utility's programs are among the most effective in the U.S. This section of the plan provides important information on the history and accomplishments of City Light's energy conservation initiatives, its conservation resource, the basis for the strategic decisions that underlie the plan, and a foundation for understanding the vision for the utility's future.

### 2.1 History of Conservation at City Light

#### ***Origin of Conservation as a Priority***

Seattle has the longest, continuously operating energy efficiency program in the nation. It has earned a well-deserved reputation as a conservation pioneer and leader. The effort began in 1972 when the "Seattle 2000" Commission identified energy conservation as *the* priority power source to serve the City's growing electrical load. The local municipal electric utility, Seattle City Light, developed its first energy conservation programs in 1977. Unlike those in so many other U.S. cities, Seattle's elected officials, working with an appointed citizen committee, determined that Seattle's load growth would be met with energy conservation rather than nuclear energy. In subsequent legislation, the City designated conservation (and renewable energy) as the City's priority energy resources. This policy direction and support continue today. Since 1977, the City and City Light have stayed committed to energy efficiency as the most cost-effective and environmentally friendly energy resource available.

*City Light has the longest, continuously operating energy efficiency program in the country.*

#### ***Energy Efficiency Programs Established***

The City's initial conservation programs focused on building public awareness with an emphasis on low-cost or no-cost actions. Changing individual behavior — particularly turning off lights, appliances, equipment and other electrical devices when not in use — was the foundation of energy conservation messages. This message is valid today. City Light built on this foundation by encouraging homeowners and business owners and managers to buy and use energy-efficient products and equipment.

In 1978, the utility developed its first grant- or incentive-based energy conservation program, to install attic insulation in the homes of low-income elderly customers. This concept was expanded to include broader weatherization services (e.g., windows, wall insulation and water heater tank wraps) for single-family and multifamily buildings. Programs targeted at specific end uses, including heating water and washing clothes, also were developed.

The utility expanded these types of services to the commercial and industrial sectors. Efforts to increase the efficiency of lighting, motors, heating/cooling equipment and custom energy management solutions were implemented and continue to be program mainstays. As with the residential sector, the commercial and industrial program offerings have been targeted at both new construction and existing buildings. To increase program participation, the utility found that financial incentives (loans, grants and/or rebates) were necessary. These incentives have addressed customers' concerns about energy conservation measures' high first-cost, and have overcome investment barriers.

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## ***Interdepartmental Leadership and Collaboration***

City Light also collaborated with other city departments to develop an aggressive municipal resource conservation program to ensure that city government facilities are constructed or remodeled in a resource-efficient manner. Thanks to this cooperation, the city is striving to meet the Leadership in Energy and Environmental Design (LEED) “silver” standard for all newly constructed facilities.<sup>9</sup> This provides significant environmental benefits, in addition to energy savings. In addition, the utility helps other departments operate their facilities more efficiently. This effort has spurred the City to purchase green products and equipment.

The utility also has a long-standing, cooperative relationship with Seattle Public Utilities to develop programs that reduce energy and water use simultaneously. These programs include: WashWise, Commercial Facility Assessments, and distribution of efficient showerheads and pre-rinse spray heads. City Light also worked with other city departments to improve the energy efficiency components of the city’s energy code.

As a result of these groundbreaking efforts, both the City of Seattle and City Light long have been considered reputable energy conservation pioneers and national leaders in resource efficiency.

## **2.2 Accomplishments and Lessons Learned**

### ***Factors for Success***

Seattle’s success and longevity in energy efficiency can be credited to a number of factors, including a supportive community, elected/ appointed officials, and legislation, all willing to make the necessary financial investment and commitments; a dedicated and technically competent staff of multi-disciplinary energy professionals; a monetary-based incentive program; and commitment to excellent customer service. These same factors will be necessary for continued success and future growth of conservation as resource.

As a sign of its success, representatives of other electric utilities, foreign governments and other city, state and federal governmental agencies routinely contact City Light for information about its programs. City Light shares its experience, knowledge, program designs and implementation challenges freely. As a result, many City Light programs and program elements have been replicated elsewhere.

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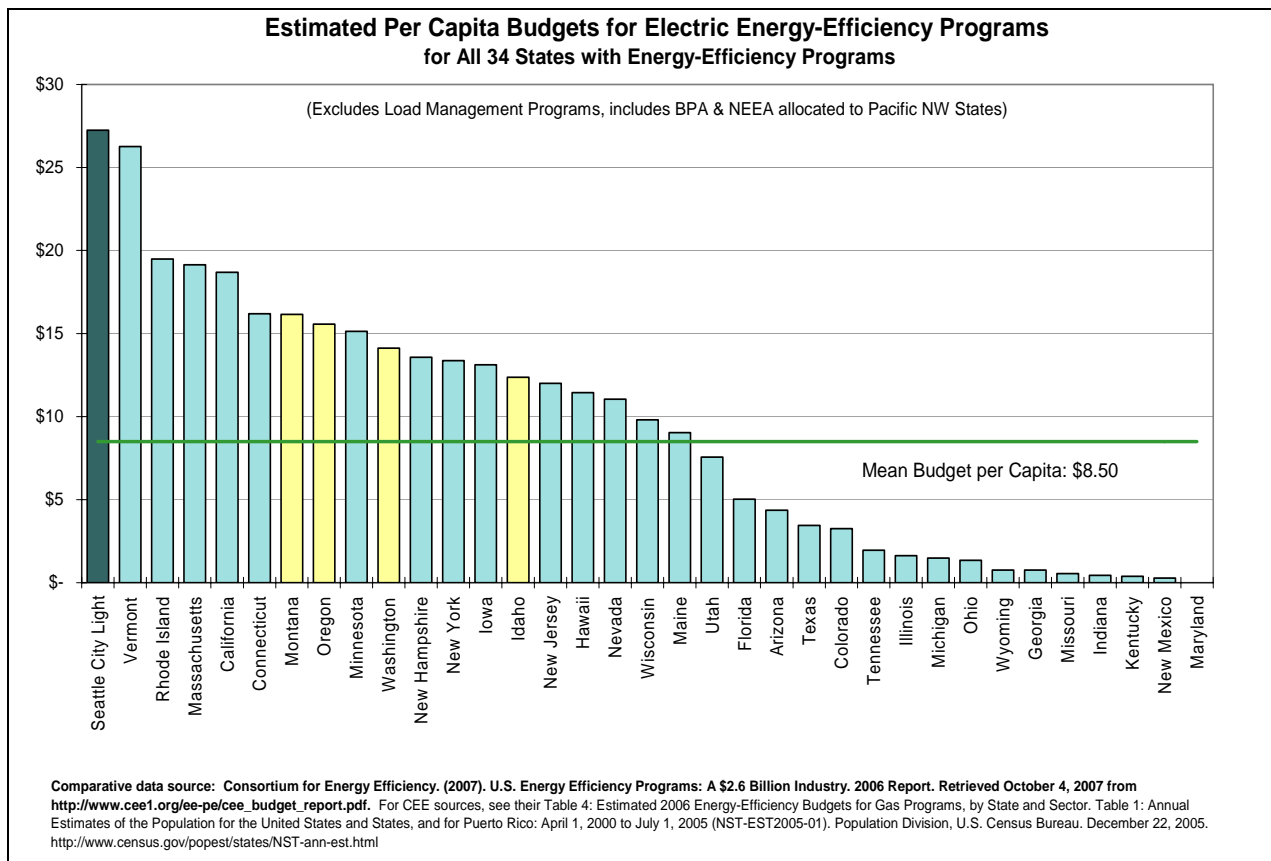
<sup>9</sup> Visit <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222> for details on the LEED Ratings System.

## Energy Engaged Citizenry

Seattle residents and City Light customers have long understood the importance of energy conservation. Figure 2, taken from a 2007 Consortium for Energy Efficiency document titled *U.S. Energy Efficiency Programs, A \$2.6 Billion Industry, 2006 Report*, shows that commitment based on conservation spending per capita. City Light (at \$27.40 per capita per year) exceeds the spending of leading states like Vermont (\$26 per capita per year), California (\$19) and New York (\$14).

The entire state of Washington spends slightly above the national average, at \$9 per capita per year. Both California and Vermont plan to increase spending significantly beginning in 2008 and 2009. To maintain City Light's national leadership position and continue to enjoy the many benefits of energy efficiency, Seattle residents must increase their investment in energy conservation, and City Light must ensure that funds are being used efficiently and effectively.

*City Light per-capita energy efficiency spending exceeds highest state levels.*



**Figure 2: A World-Class Level of Commitment: Conservation Spending Per Capita**

Today, the City relies on approximately 60 multi-disciplinary professional staff in the Conservation Resources Division to deliver a broad array of energy conservation and energy efficiency services. The City finances its capital programs through current revenues and the



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issuance of bonds, which are paid for from revenues generated by City Light's electricity billings.

It is important to note that City Light did not develop, implement or operate these energy efficiency programs in a vacuum. The utility consistently has built and relied upon partnerships and collaborative efforts to initiate and sustain its progressive approach to energy efficiency. Other electric utilities, governmental agencies, consultants, contractors, vendors, retailers and manufacturers have helped the programs succeed.

## **Standards**

Furthermore, City Light has been actively involved in the development of local and national energy efficiency standards. The Seattle Energy Code for commercial buildings, which is more stringent than the Washington State Energy Code, has become a model for other jurisdictions. Moreover, the City of Seattle has participated actively in revisions to the State of Washington Energy Code, which affects both residential and commercial construction.

## **Links to Sustainability Initiatives**

Over the last few years, a number of sustainability initiatives have linked energy efficiency to long-term building performance. The NW Regional Sustainable Building Action Plan led to the development of the Sustainable Building Advisor Certificate Program, the formation of the Seattle Green Building Team, adoption of the City of Seattle's Sustainable Building Policy and the creation of LEED and Built Green incentive programs. All have an energy-related component and have received active technical and financial support from City Light. They also inform the proposed *Five-year Conservation Action Plan*.

## **National Awards**

Various components of the City's conservation program have earned national awards, including: best website development for a government agency; innovative marketing with a local professional sports team, and innovative use of the U.S. Postal Service. The overall program also has achieved national recognition including: inclusion of program achievements in the Congressional Record, an award from the U.S. Competition for Metropolitan Energy Design, designation by a U.S. Department of Energy-funded study as one of the most effective energy efficiency programs in North America, and inclusion in a feature article in *The Nation* magazine's "What Works Series".

## **Future Savings**

Figure 3 on the following page documents City Light's "conservation power plant", or the accumulated energy savings from program inception in 1977 to 2006 (Conservation Resources Division estimates have been used for 2007). From these efforts, City Light in 2006 saved enough energy to power 118,400 Seattle homes for one year and avoided 603,800 tons of carbon dioxide emissions—equivalent to keeping over 130,000 cars off the road for a year, or one car for every three households in City Light's service territory. Considering all of the energy savings realized since 1977, the City has saved over 7 billion kWh, which is enough electricity to power 340,000 homes for two years. In "nominal" dollars — dollars not adjusted for inflation — customer bill savings have totaled \$245 million. From an environmental perspective, these energy savings equal a reduction of 3.1 million tons of carbon dioxide

emissions, the equivalent of removing 25,000 cars from the roads for 25 years. These achievements are even more impressive given that Seattle's electricity rates are among the lowest in the country and therefore do not always give customers the strongest motivation to save energy.

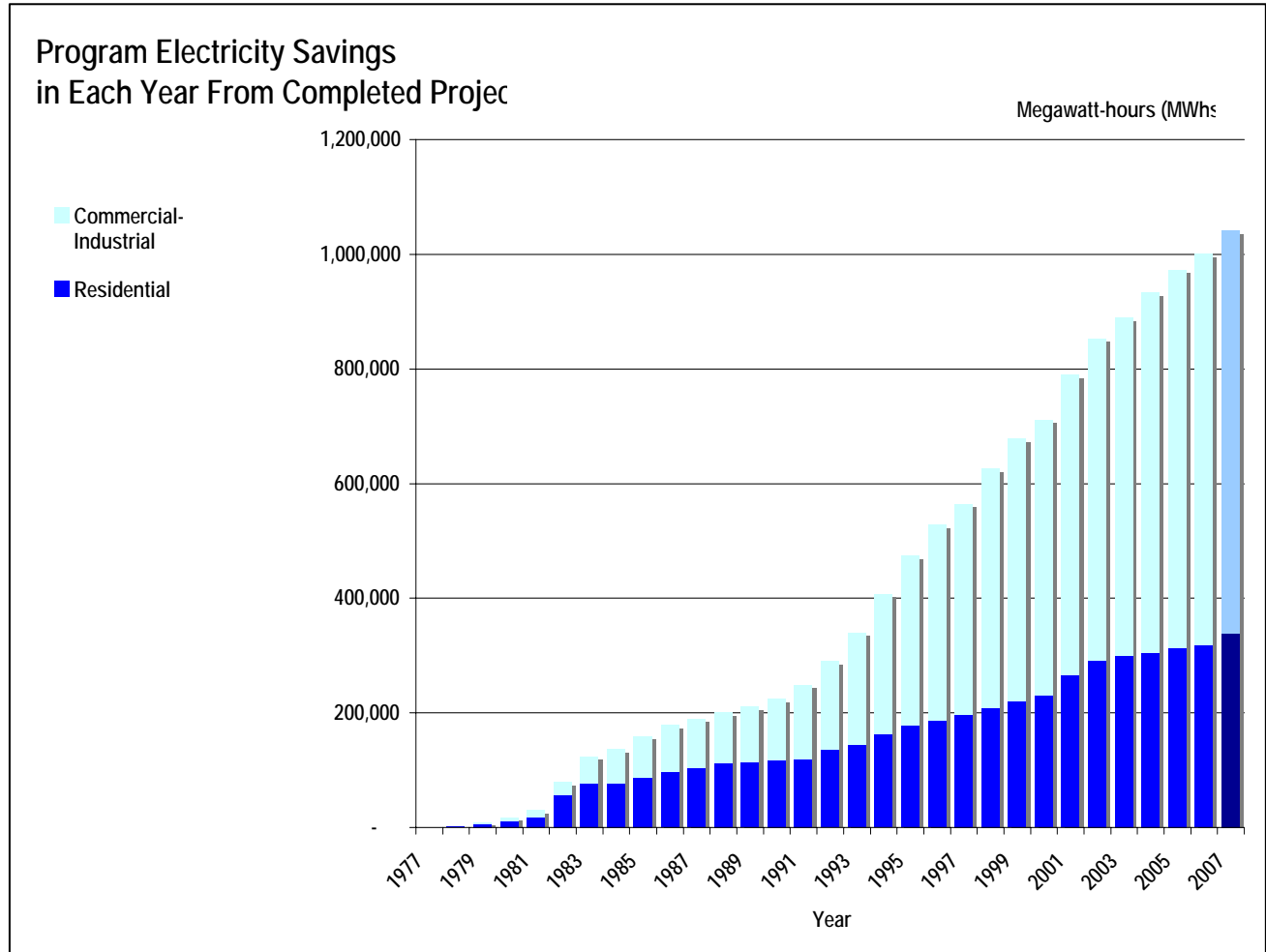


Figure 3: Seattle Electricity Savings through Energy Efficiency Programs by Year

### Notable Achievements

The following timeline outlines City Light's energy efficiency achievements since its inception.

**Table 3: City Light Energy Conservation Timeline**

1972	▪	The "Seattle 2000" commission is established and identifies energy conservation as the first choice to be pursued by City Light in meeting the City's energy requirements. (City Council Resolution No. 23684)
1973	▪	Goals and objectives of "Seattle 2000" are adopted. The topic of "environment" includes goals and objectives for pollution, energy, population and land use. (City Council Resolution No. 24283)
1976	▪	The City decides, through the "Energy 1990" public planning process, not to invest in nuclear power plants and gives priority to energy conservation and renewables (City Council Resolution No. 25260).
1977	▪	City Light's Office of Conservation is created. (City Council Resolution No. 25259)
1978	▪	City Light develops and delivers the City's first energy conservation program.
1979	▪	Seattle establishes the first energy efficiency requirements in Washington and the U.S.
1981	▪	The Low-Income Electric Program starts to weatherize single-family homes. The conservation funding relationship with Bonneville Power Administration begins.
1982	▪	The initial <i>Conservation Potential Assessment</i> is published.
1983	▪	The Conservation and Solar Division evolves by adding field staff to deliver multiple conservation programs and services. The first <i>Energy Conservation Accomplishments</i> annual report is published.
1984	▪	The annual conservation program budget is established, at about \$10-15 million for the next seven years.
1987	▪	The Energy Management Services Division evolves from the former C&S (Conservation and Solar?) Division.
1988	▪	The Industrial Retrofit Demonstration Project tests efficiency measures for industrial processes.
1989	▪	City Light creates the Lighting Design Lab.
1990	▪	The Seattle City Council confirms its resolve to meet continued load growth with conservation as its first priority resource. (Resolution No. 28258)
1991	▪	The conservation programs' annual budgets rise to over \$20 million.
1992	▪	The Citizen's Conservation Committee recommends a 100 average megawatt conservation goal, which is confirmed by the Mayor and City Council in the <i>Energy Resources Strategy</i> . (Resolution No. 28560)
1993	▪	Efforts of the Conservation Task Force lead to the <i>Conservation Implementation Plan</i> (CIP).
1995	▪	City Light acquisition of conservation energy savings surpasses 50 average megawatts as of this year. City Light begins federal Voluntary Reporting of Greenhouse Gas reductions due to conservation and system efficiencies.
1996	▪	The five-year <i>Energy Management Services Plan</i> (EMSP) is published.
1998	▪	Seattle continues to affirm the importance of conservation with annual budgets that remain around \$20 million.

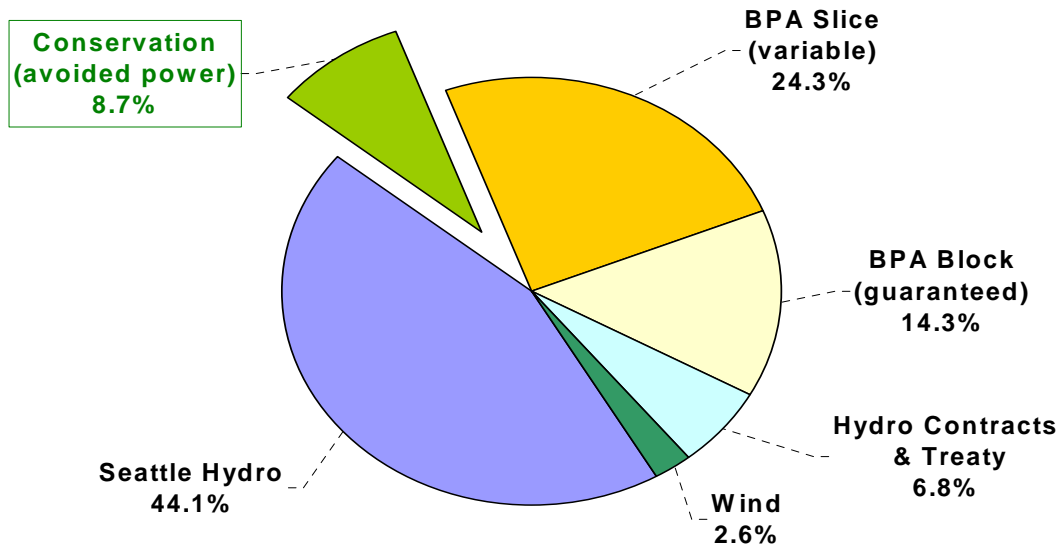
**Table 3: City Light Energy Conservation Timeline (continued)**

1999	<ul style="list-style-type: none"> <li>▪ City Light's acquisition of conservation energy savings surpasses 73 average megawatts.</li> <li>▪ City Council Resolution No. 30021 reaffirms the commitment to conservation and renewable resources as the first priority for replacing the Centralia coal plant.</li> <li>▪ Annual carbon dioxide emission reductions from the energy conservation program exceed 175 thousand tons, equivalent to garaging 35,000 vehicles for a year.</li> </ul>
2000	<ul style="list-style-type: none"> <li>▪ The 2000 Earth Day Resolution (No. 30144) establishes the goal of meeting Seattle's electric needs with no net greenhouse gas emissions.</li> <li>▪ The Northwest Power Planning Council completes the <i>Conservation Potential Assessment</i> for City Light's <i>2000 Strategic Resource Assessment</i>. The technically feasible potential exceeds 260 aMW.</li> <li>▪ City Light's <i>2000 Strategic Resource Assessment</i> recommends doubling the utility's annual conservation effort from 6 aMW to 12 aMW.</li> </ul>
2001	<ul style="list-style-type: none"> <li>▪ This is the year of the West Coast "energy crisis."</li> <li>▪ City Council Resolution No. 30280 calls for the acceleration of the City's Green Building Program, which includes an intention to make the Seattle Energy Code more stringent.</li> <li>▪ The 2001 Earth Day Resolution (City Council Resolution No. 30309) calls for increasing water and energy efficiency in City facilities, and the use of sustainable building practices in Seattle through acceleration of the City's Green Building Program.</li> <li>▪ Conservation Acceleration (ConXL) is initiated to double the annual energy conservation goal to 12 aMW.</li> </ul>
2002	<ul style="list-style-type: none"> <li>▪ The Bonneville Power Administration and City Light sign a Conservation Augmentation (Con Aug) Contract for \$26.66 million for 18 aMW in energy savings from City Light's energy conservation programs.</li> <li>▪ The Energy Management Services Division celebrates its 25th anniversary, signifying the longest continuously operated energy conservation program in the United States.</li> <li>▪ The 2002 Strategic Resource Assessment continues to support a 12 aMW energy conservation goal.</li> <li>▪ The Division's annual budget is \$24.3 million.</li> <li>▪ The City of Seattle wins an <i>Energizing America's Cities</i> sustainable energy planning competition for its energy efficiency efforts.</li> <li>▪ City Light initiates its Green Power Program. Customers voluntarily contribute funds to install solar systems on public facilities and to invest in new renewable energy resources.</li> </ul>
2004	<ul style="list-style-type: none"> <li>▪ BPA and City Light sign a new three-year, 7.2 aMW Con Aug agreement.</li> </ul>
2005	<ul style="list-style-type: none"> <li>▪ City Light initiates a new Integrated Resource Plan effort and Conservation Potential Assessment.</li> <li>▪ City Light initiates discussions with BPA for Post-2006 funding.</li> <li>▪ City Light launches the Green-Up Program.</li> </ul>
2006	<ul style="list-style-type: none"> <li>▪ City Light enters into a new three-year conservation funding agreement with BPA.</li> </ul>
2007	<ul style="list-style-type: none"> <li>▪ City Light launches the Twist &amp; Save CFL retail program as part of the Seattle Climate Action Now campaign</li> </ul>
	<ul style="list-style-type: none"> <li>▪ City Light co-launches a new program for low-flow showerheads with Seattle Public Utilities</li> </ul>
2008	<ul style="list-style-type: none"> <li>▪ City Light launches its Refrigerator Recycling program.</li> </ul>

## 2.3 Delivering Conservation Savings

As stated above, the City of Seattle and City Light have had a long history of developing and implementing effective energy conservation programs. Since 1977, City Light has continuously delivered conservation as a resource to meet the electricity needs of the community.

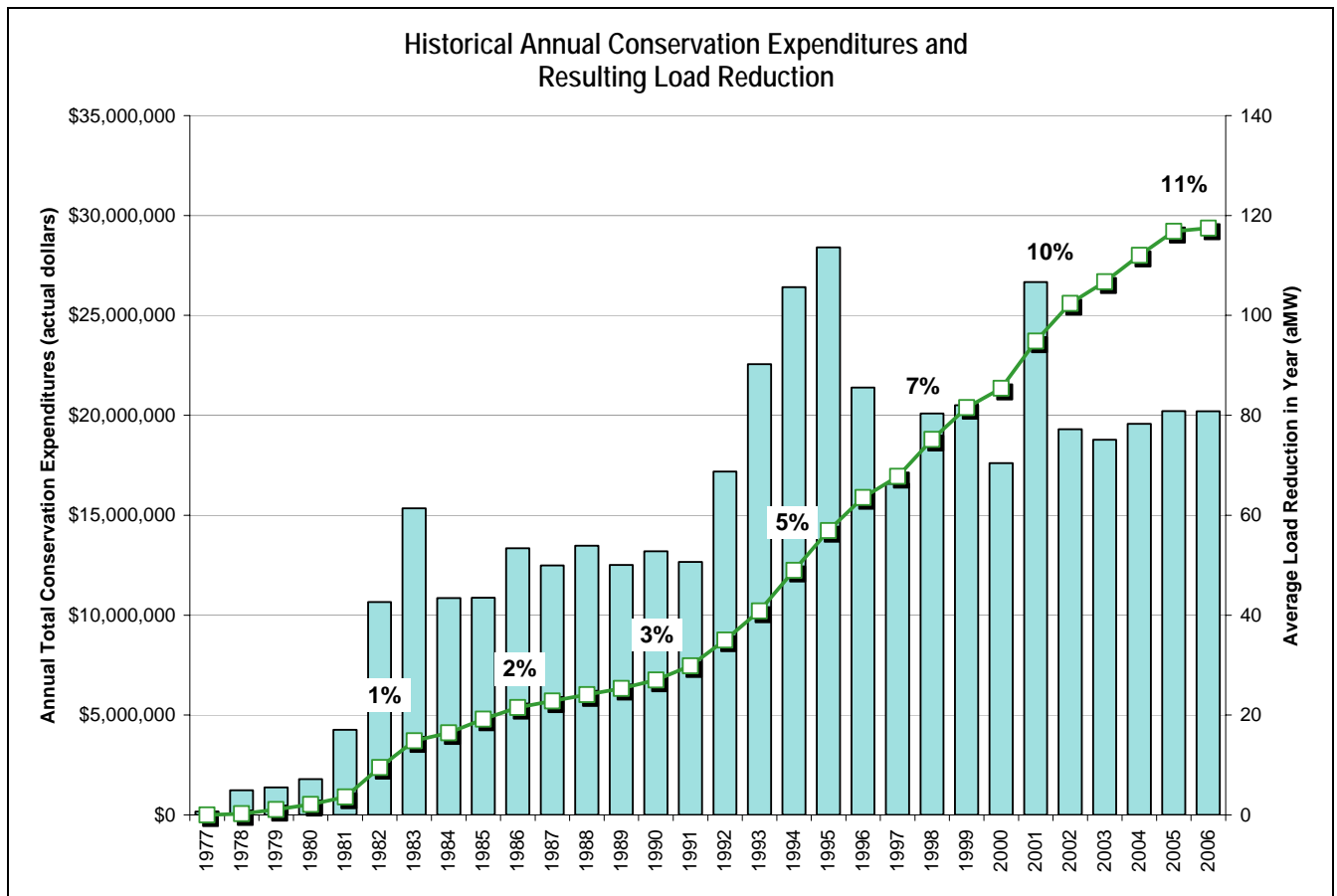
Through 2007, the utility had delivered approximately 119 aMW in conservation savings that meet approximately 11 percent of annual load requirements and nearly 9% of City Light's total power supply. The latter point is documented in the following chart for 2007.



**Conservation:  
The least-cost  
resource.**

**City Light  
programs have  
saved ratepayers  
over \$490  
million since  
1977.**

Figure 4 shows both spending per year and cumulative conservation savings. This equates to avoided generation worth over \$61,000,000 using the 2006 Integrated Resource Plan estimated avoided cost for conservation (valued at \$60/MWh). Based on current estimates, this is the equivalent of avoiding 615,000 metric tons of CO<sub>2</sub> per year, or removing 135,000 cars from Seattle's busy highways over this same period. Since 1977, cumulative customer bill savings total more than \$490,000,000 in nominal dollars.



**Figure 4: Conservation as a Growing Resource**

\*Percentages represent % of total retail sales met by conservation savings

For City Light, conservation always has been delivered as a “cost-effective” resource. In the 2006 *Integrated Resource Plan*, conservation was selected on a “get as much as is available” basis. Budget and organizational constraints limited the amount of conservation pursued in 2006 and 2007, and will affect savings in 2008. As with any sustaining resource, building the “plant” takes time. Assuming a November 2008 approval of the Five Year Plan, City Light would immediately begin delivering and documenting the recommended plan.

In terms of cost-effectiveness, if City Light were to continue on its present course, it would expect to invest approximately \$21,000,000 per year to achieve energy savings of approximately 63,500 MWhs (7.25 aMW times 8,760 hours per year). Simple math indicates a cost of \$330 per first-year MWh. While this may seem expensive, it must be clear that each energy conservation measure has a useful life of three to 30 years, with a shorter useful life for some measures (CFLs) and a longer useful life for others (windows and insulation). For example, if City Light uses a very

***Conservation can be delivered for as low as 3.3 cents per kWh -- well below market cost.***

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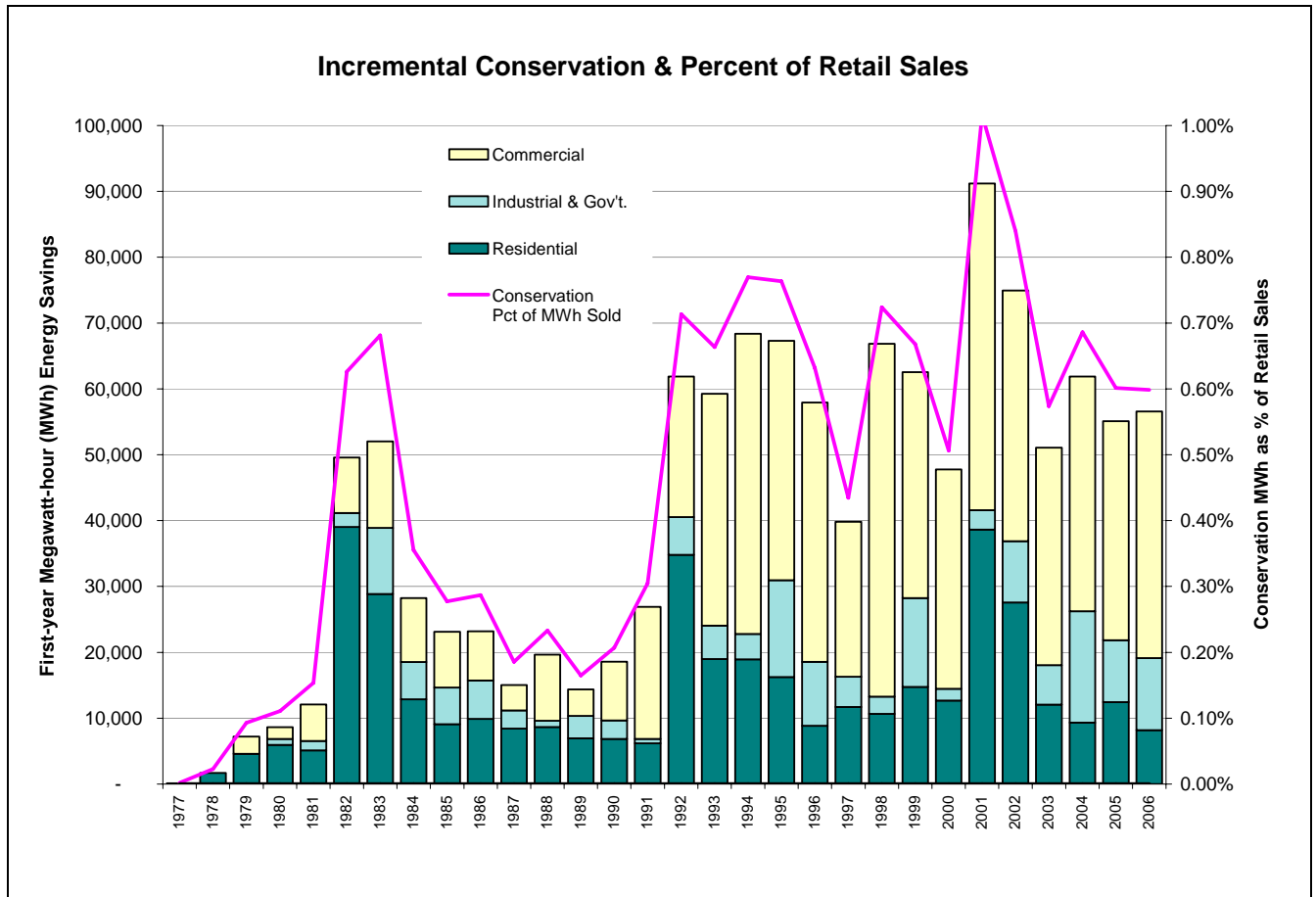
conservative average life of 10 years for all measures - as described in the proposed plan - the cost of the savings can be divided by 10 to obtain a yearly cost. This yields a delivered cost of \$33 per MWh or 3.3 cents per kWh -- well below the cost of market-based power and the next incremental power plant contained in the Integrated Resource Plan<sup>10</sup>. It is simply cheaper to help City Light customers save energy than for the utility to buy that energy in the market or build power plants to produce it.

While residential programs dominated City Light's early conservation efforts, over the last several years the utility has achieved most of the conservation savings in the commercial and industrial market segments. As seen in **Figure 5** on the following page, in 2006, 80 percent of the total savings were achieved in those two customer segments. Less than 20 percent of the total savings comes from the residential segment, although it accounts for 32 percent of total retail sales.

**Figure 5** also shows total conservation savings as a percent of total retail sales. This is becoming the national standard to gauge the effectiveness of conservation programs. Programs saving between one percent and two percent or offsetting 100 percent of load growth are considered "national leaders," as represented in a recent American Council for an Energy-Efficient Economy, (ACEEE) study. City Light is one of the top performers, but is slightly below the nationally recognized industry leaders.

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<sup>10</sup> An economic analysis must reflect the time value of money and discount the future benefits of the energy savings, resulting in a slightly higher cost per MWh of about \$37.60, or 3.76 cents per kWh.



**Figure 5: Conservation Market Segments and Savings as a Percent of Retail Sales**

Thanks, in part, to City Light's conservation efforts, its customers have reduced both their average energy use and average rates. **Figure 6** on the following page shows two sets of curves. The right Y-axis shows average residential customer energy use per year in kWh/yr. Due to new technology and better building components and education, between 2001 and 2006, average residential customer electricity use decreased by almost 30 percent, to just over 9,000 kWh per year.<sup>11</sup> This contrasts with a national trend over the last three decades of a gradual increase in energy use per customer. The left Y-axis shows the average residential rate in cents/kWh. City Light staff has delivered conservation resource programs that have kept the rates approximately three cents per kWh below the national average. Since the 2001-2002 energy crisis, City Light gradually has

*Average energy use in Seattle has declined, while increasing nationally.*

<sup>11</sup> Recent increases in the proportion of multifamily housing in the residential sector, resulting from conscious regional and city policies to concentrate development in urban centers, may contribute to this trend.



reduced its rates while making its entire operation more efficient. Per these trends, City Light will increase the gap between its rates and the national average.

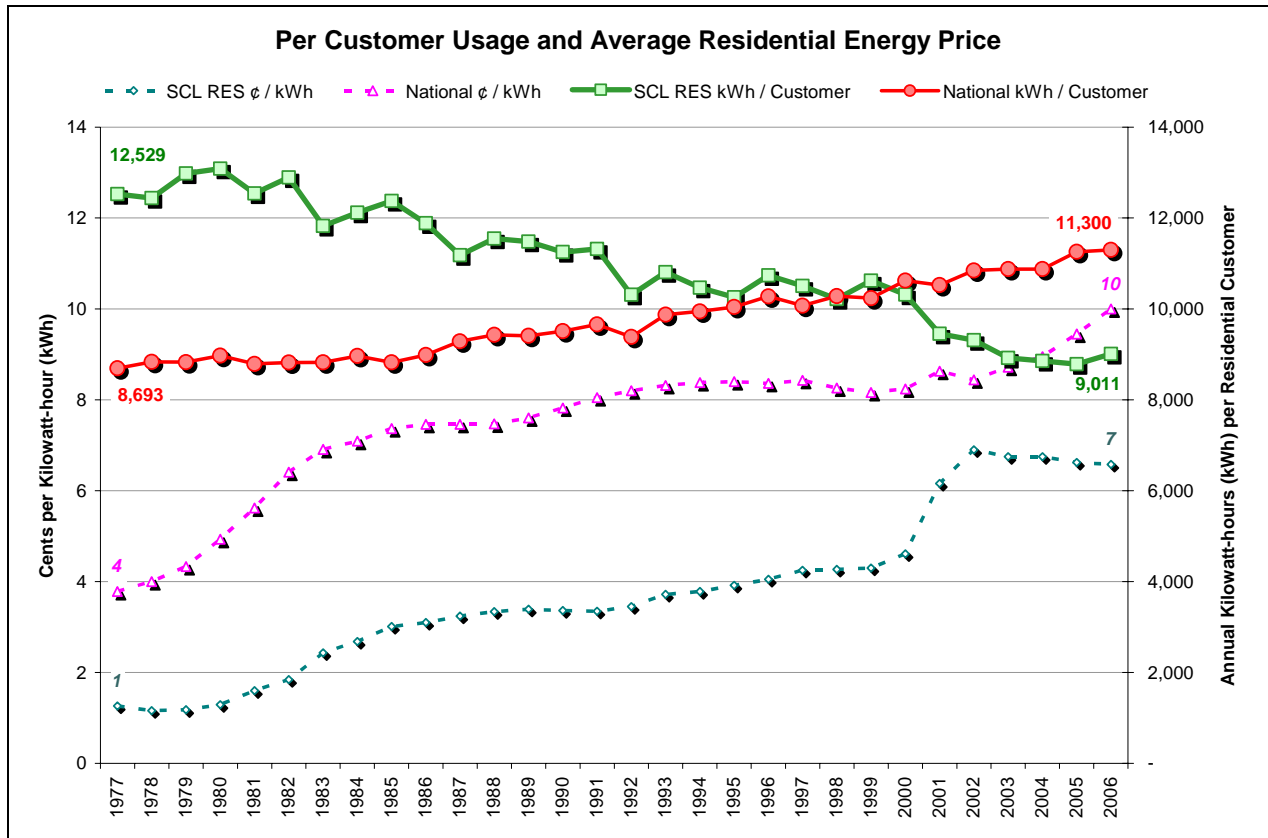


Figure 6: Residential Customer Use and Rates vs. National Average

When Figures 4, 5 and 6 are taken together, an interesting challenge arises. The residents of Seattle are committed to and invest in their energy efficiency programs. Since the 1970s, City Light has proven that conservation can reduce the demand for power and new power plants without adverse impacts on rates and, more importantly, on customers' bills. However, in today's competitive world, City Light's Conservation Resources Division is performing at a slightly lower level vis-à-vis other programs nationwide. Therefore, City Light must focus its efforts on expanding programs, and improving their efficiency.

*World-class programs will require increased investment and effectiveness.*

This is the challenge of the *Five-year Conservation Action Plan*. The rest of this document will present a path to increase energy efficiency, deliver more kWh savings per dollar spent per program, and return City Light's Conservation Resources Division to national technical and financial leadership.

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## 2.4 The Size of Seattle's Conservation Resource

As part of City Light's 2006 Integrated Resource Planning process, the Division updated its Conservation Potential Assessment (CPA).<sup>12</sup> This assessment gives City Light information about energy-savings opportunities and costs for all of its customer segments. City Light staff uses this information to guide its strategies. The process is described below and summarized by **Figure 7** on the following page. City Light will be updating the CPA again beginning later in 2008, with a draft CPA expected mid-2009.

The breakout of these savings in hypothetical maxima for years five, 10 and 15 are presented in **Table 4**. These projections of achievable savings are consistent with the savings shown in **Table 1** from **page 2** that SCL anticipates through implementing this plan

Segment	aMW Savings		
	5 Years	10 Years	15 Years
Residential	21.6	47.2	71.3
Commercial	37.7	81.3	120.4
Industrial	10.3	23.4	37.1
<b>Total</b>	<b>69.6</b>	<b>151.8</b>	<b>228.8</b>
<b>Total as % of Baseline Forecast</b>	<b>5.8%</b>	<b>12.9%</b>	<b>18.1%</b>

**Table 4: Achievable Conservation by Sector**

The CPA is consistent with industry approaches and distinguishes between two distinct, yet related, definitions of energy efficiency potential that are widely used in utility resource planning: *technical potential* and *achievable potential*. Technical potential assumes that all demand-side resource opportunities that are cost effective may be captured, regardless of market barriers. Achievable potential, on the other hand, represents that portion of technical potential that is likely to be available over the planning horizon, given prevailing market barriers that may limit the implementation of demand-side measures.

The most recent CPA examined energy savings available across the major sectors in City Light's service area:

- Residential – three dwelling segments and 14 end-uses
- Commercial – 12 building segments and 24 end-uses
- Industrial – six industrial segments and seven end-uses.

The CPA analysis considered dozens of individual measures, with hundreds of permutations across segments and construction vintages, distinguishing between discretionary (e.g., shell and

*City Light  
examined  
potential savings  
from dozens of  
measures across  
all markets*

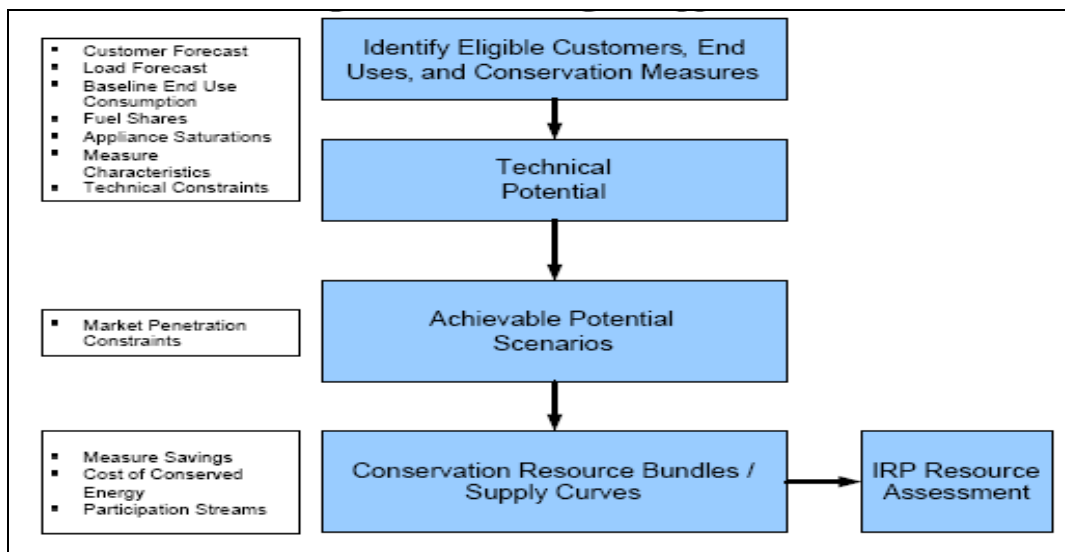
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<sup>12</sup> *Conservation Potential Assessment*. Prepared for Seattle City Light by Quantec. LLC. October 13, 2006.

lighting retrofit) and lost opportunity (equipment replacement and new construction) resources. A wide range of measure-specific, economic and market information was compiled for this study, including primary data [City Light's forecasts, customer characteristics surveys and demand-side management (DSM) program achievements] and secondary sources (including the Northwest Power and Conservation Council's Regional Technical Forum, the Energy Information Administration and the California Energy Commission's Database for Energy Efficient Resources).

The development of an accurate baseline is of primary and fundamental importance to such an effort. It includes the present stock of equipment efficiency characteristics and expected changes in stock equipment efficiencies over the planning horizon due to codes, standards and naturally occurring conservation.

The general methodology and analytic techniques in the CPA study conform to standard utility industry practices and methods. The approach begins with the current load forecast divided into sectors, market segment and end-use components, and then examines the effect of the range of energy efficiency technologies and strategies on each end use. These impacts then are aggregated to produce energy efficiency potentials at the end-use, sector and system levels. This general methodology is presented diagrammatically in **Figure 7**; more detailed information is provided in the section that follows.



**Figure 7: Methodological Approach**

### ***Develop Base Case Forecast***

The base case end use forecast establishes a benchmark against which the impacts of the phase-in technical and achievable energy-efficiency potentials can be assessed. The forecast for this study was calibrated to City Light's 2004 energy sales, customer forecasts and appliance and equipment saturations from a variety of sources. This step provides an estimate of future energy consumption in the absence of new energy efficiency programs. Also taken into account are the effects of equipment standards and naturally occurring efficiency improvements, which relate to the reduction of usage as low-efficiency equipment is replaced by higher-efficiency equipment.

### Determine Measure Impacts

This step involves integrating measure-specific data (per-unit costs, savings and measure life) with baseline building stock data (base case fuel saturations, measure applicability factors and current measure saturations) and base case-calibrated energy usage data to produce estimates of levelized costs per unit of conserved energy. More information on measure savings calculations is presented later in this chapter.

### Estimate Phased-in Technical Potential

The technical potential for energy efficiency was then estimated using the Intervention Strategies module, which effectively overrides the base case energy usage and market equipment efficiency shares. Alternative scenarios were incorporated directly into the relevant Product Usage and Provider Choice forecasts. Phased-in technical potentials were calculated by subtracting the energy forecast associated with the highest possible penetration of energy efficiency measures from the base case forecast.

Based on the results of this study, cumulative 15-year achievable<sup>13</sup> conservation potentials in City Light’s service area are estimated at nearly 229 aMW of electricity, representing more than 18 percent of the baseline electricity consumption forecast for 2020. Figure 8 shows these hypothetical maximum aMWs by sector for years five (70 aMW), 10 (151 aMW) and 15 (229 aMW) of the planning horizon.

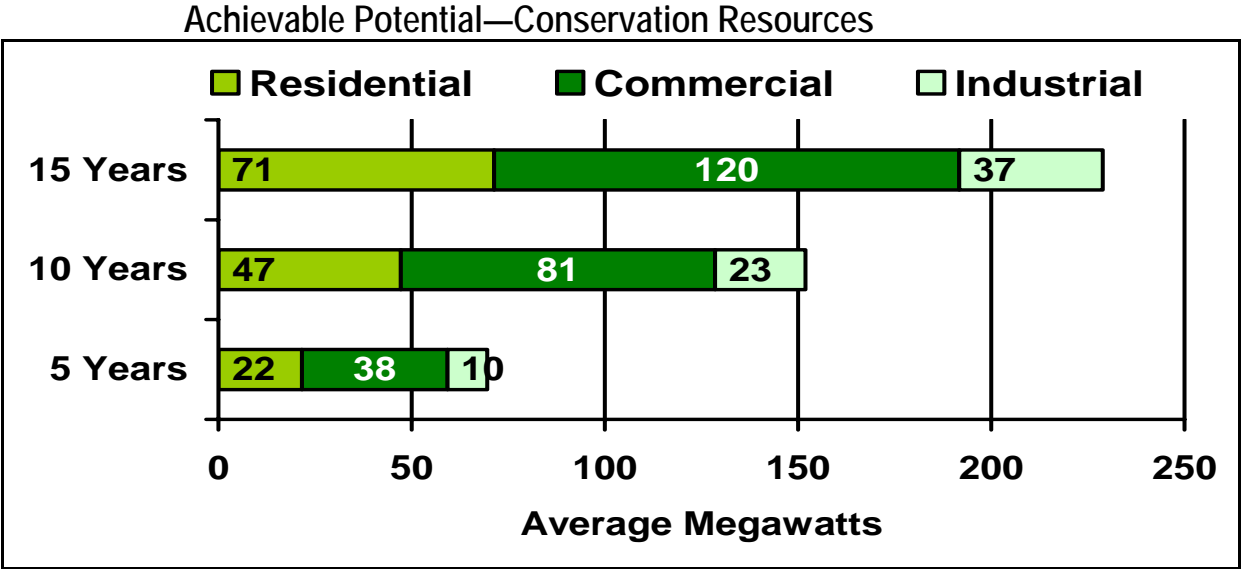


Figure 8: Hypothetical Maxima (Achievable Potential) by Sector

<sup>13</sup> Since achievable potential estimates represent a percentage of the technical potential estimates, only the results for achievable potential are presented.

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Figures 9-14 show that portion of technical potential that is achievable (achievable potential) based on market sector and that market's end use.

### ***Residential Achievable Conservation Potential***

Figure 9 shows the distribution of estimated total achievable potential for the residential sector by dwelling type through 2020. Single-family homes represent 62 percent of this potential.

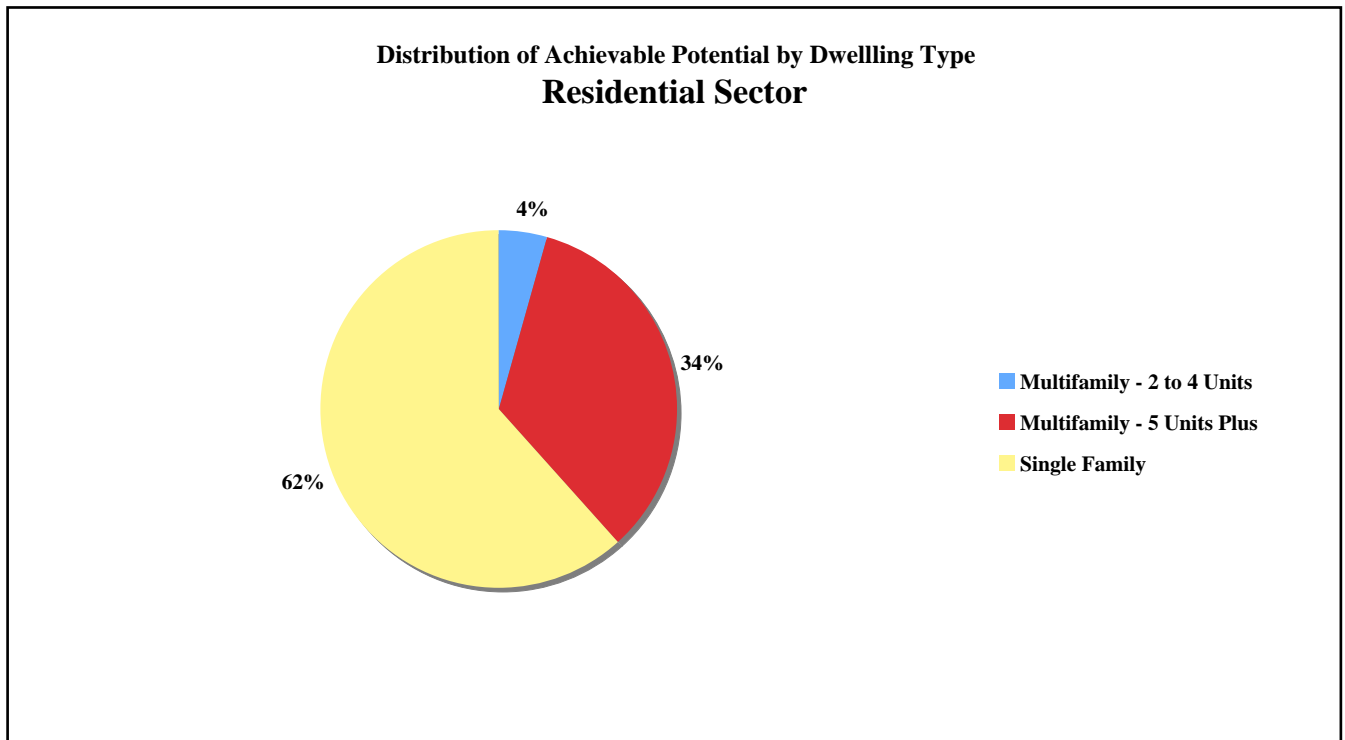


Figure 9: Distribution of Achievable Potential by Dwelling Type, Residential Sector

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Figure 10 shows the distribution of estimated achievable potential for the residential sector by end use. Lighting uses comprise 43 percent of this potential; while space heat and water heat each comprise over 20 percent.

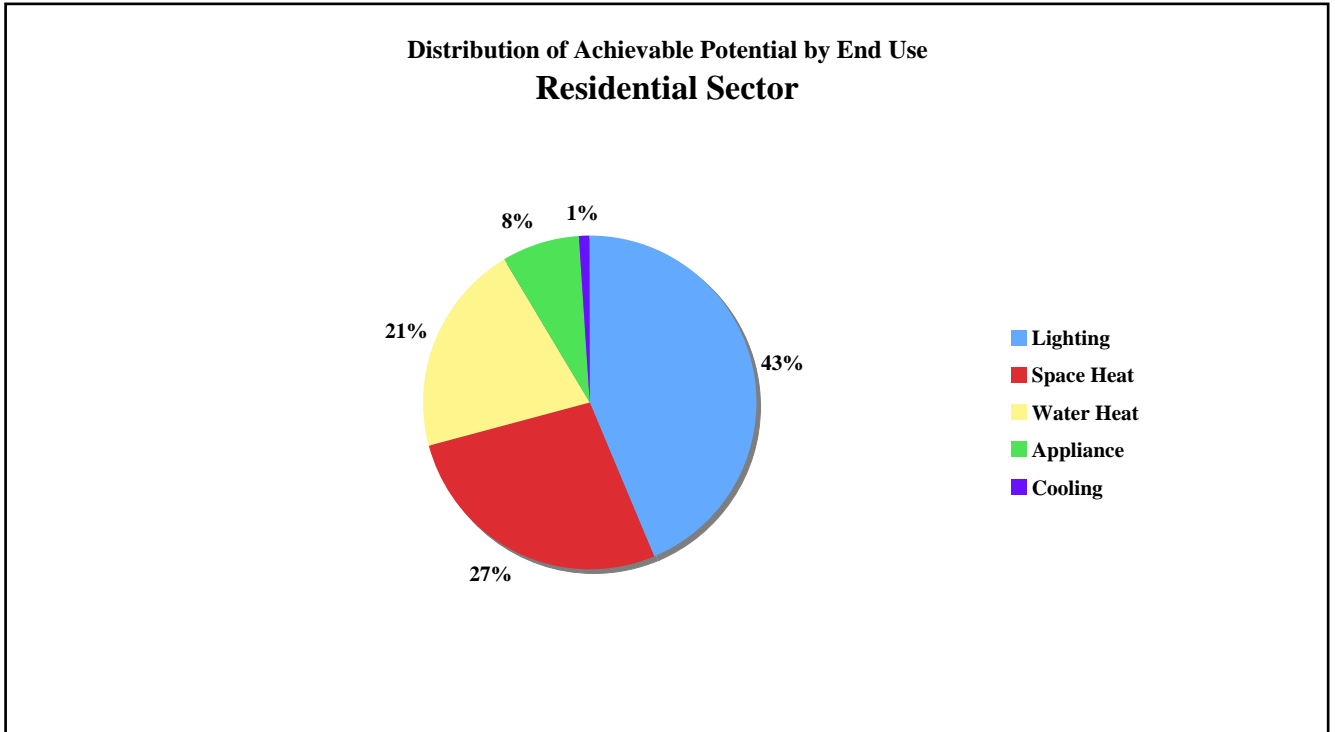
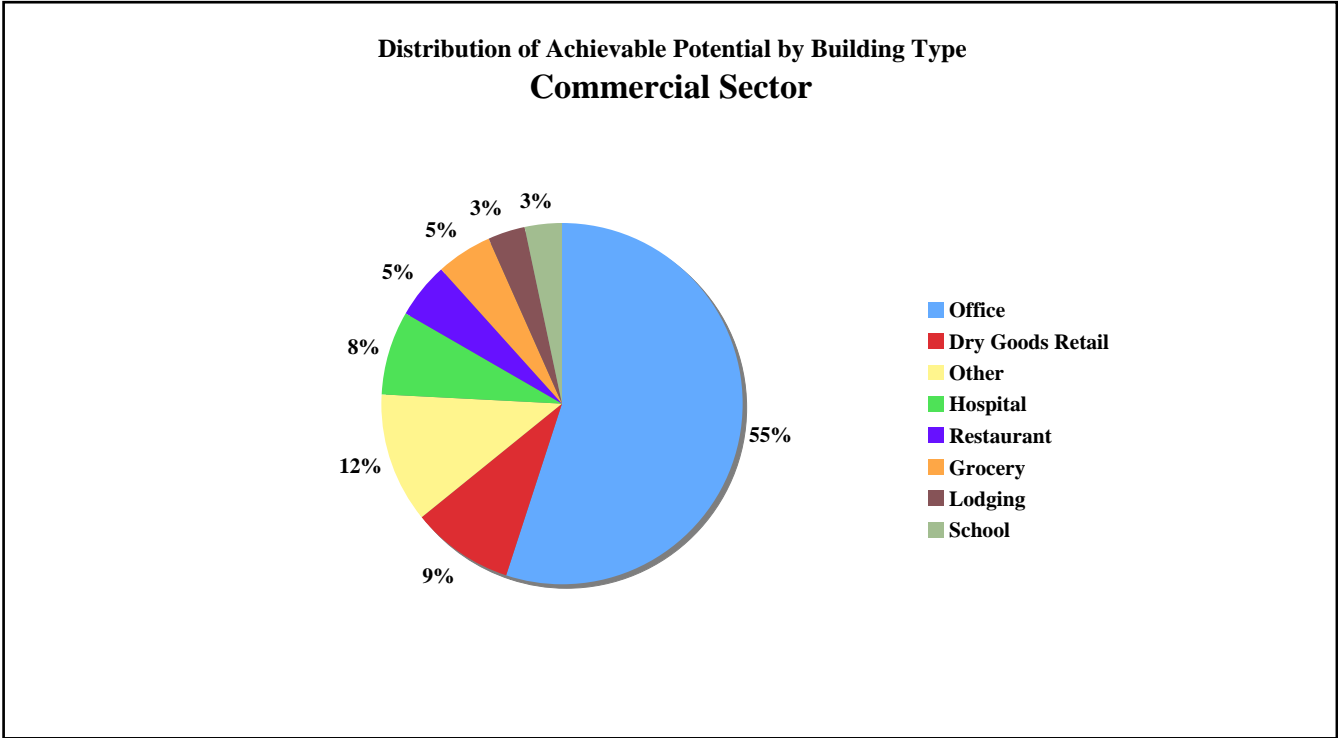


Figure 10: Distribution of Achievable Potential by End Use, Residential Sector

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### **Commercial Achievable Conservation Potential**

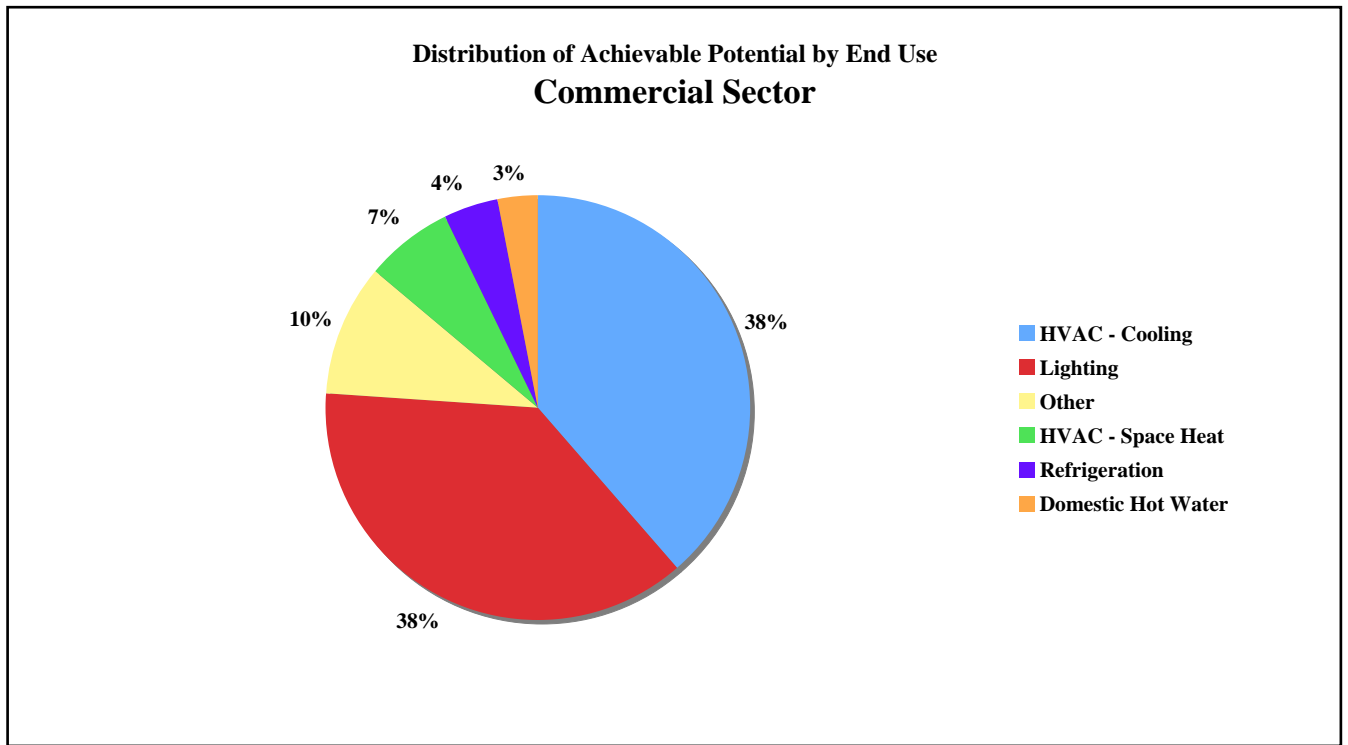
The following graph, **Figure 11**, depicts the distribution of estimated achievable potential conservation that is achievable over the planning horizon for the commercial sector by building type. Office buildings account for 55 percent, while all other building types represent no more than 12 percent of this potential.



**Figure 11: Distribution of Achievable Potential by Building Type, Commercial Sector**

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The next graph, **Figure 12**, shows the distribution of estimated achievable conservation potential that is achievable over the planning horizon for the commercial sector by building type. Lighting and heating/cooling account for 38 percent each—the majority of this potential.



**Figure 12: Distribution of Achievable Potential by End Use, Commercial Sector**



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## Industrial Achievable Conservation Potential

Figure 13 shows the distribution of estimated potential achievable conservation for the industrial sector by segment. A single manufacturing category, Stone Clay Glass, represents 40 percent of this potential, while metals account for 26 percent.

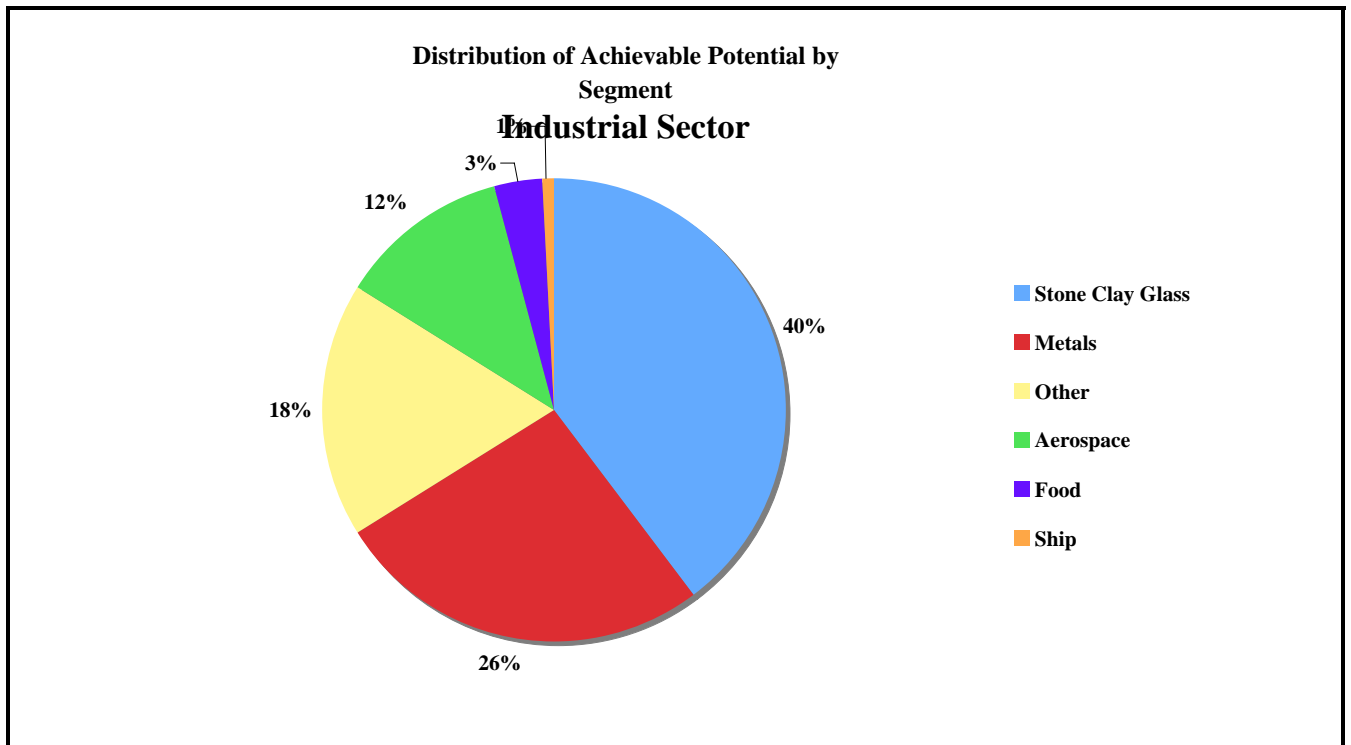
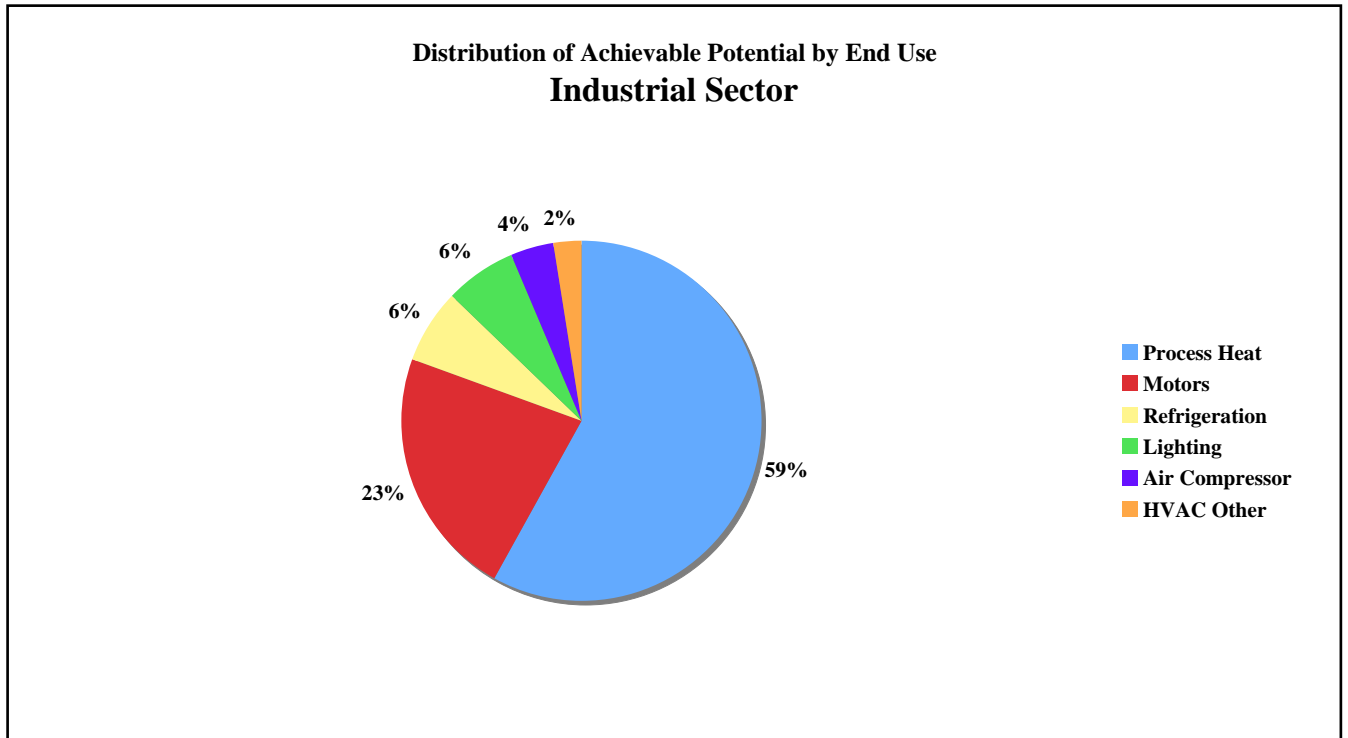


Figure 13: Distribution of Achievable Potential by Segment, Industrial Sector

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The last graph in this series, **Figure 14**, shows the distribution of estimated achievable conservation potential for the industrial sector by end use. Process heat comprises nearly 60 percent of this potential, and motors account for 23 percent.



**Figure 14: Distribution of Achievable Potential by End Use, Industrial Sector**

Table 5 below summarizes the 5-, 10-, and 15-year achievable potential by sectors and subsector.

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Sector	5 Year	10 Year	15 Year
Residential			
Single Family	13.3	29.0	44.0
Multifamily 2 – 4	1.0	2.1	3.2
Multifamily 5+	7.3	16.0	24.1
<b>Res'l Subtotal</b>	<b>21.6</b>	<b>47.1</b>	<b>71.3</b>
Commercial			
Office	20.6	44.4	65.7
Retail	3.3	7.1	10.5
Hospital	2.7	5.8	8.6
Other	11.1	24.0	44.6
<b>Comm'l Subtotal</b>	<b>37.7</b>	<b>81.3</b>	<b>120.4</b>
Industrial			
Stone, Clay, Glass	4.1	9.3	14.8
Metals	2.7	6.2	9.8
Aerospace	1.2	2.8	4.5
Other	2.3	5.1	8.0
<b>Ind'l Subtotal</b>	<b>10.3</b>	<b>23.4</b>	<b>37.1</b>
<b>TOTAL</b>	<b>69.6</b>	<b>151.8</b>	<b>228.8</b>

Table 5: Achievable Potential by Sector and Subsector

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## 3. ENVISIONING A WORLD-CLASS CONSERVATION UTILITY

In light of its past achievements and future potential for and multiple benefits from energy efficiency, Seattle City Light can and must continue to deliver its effective energy efficiency programs and visualize and implement additional new programs. The *Five-year Conservation Action Plan* integrates the City's current objectives and policy drivers to ensure that City Light remains a conservation utility that benefits its customers and the region and creates a model for utilities throughout the U.S. and world.

### 3.1 Through the Climate Action Lens

#### **Seattle Climate Action Plan**

The 2006 Seattle Climate Action Plan<sup>14</sup> (SeaCAP) seeks to reduce the City's greenhouse gas emissions and promote reductions by Seattle's households, businesses and public institutions. The latest SEACAP status report includes actions outlined by the City's Office of Sustainability and Environment, which directly relate to City Light or specifically call for the utility to act in response to climate change. In particular, the creation and implementation of this *Five-year Conservation Action Plan* responds to the Mayor's goal of reducing energy use in existing buildings by 20% by increasing City Light's initial conservation goals.

*City Light is on target to meet the savings goals in the 2006 Seattle Climate Action Plan.*

- **Action** – City Light must produce net zero emissions and meet load growth with conservation and renewable energy.
  - **Element** – City Light will acquire 7.25 average MW of energy conservation in 2007 and 2008.
    - **Status** – City Light is on target to meet these savings goals, which are incorporated into the Integrated Resource Plan. Programs such as Lighting Trade Ally and CFL Retail ("Twist & Save") offer significant savings. Other examples of energy savings will be shown in subsequent sections.
  - **Element** – City Light will promote energy efficiency through education campaigns.
    - **Status** – Several City Light energy efficiency programs have an educational component, including but not limited to Energy Smart Services, the Lighting Design Lab, Small Scale Renewables – Green Power, Small Scale Renewables – Incentive Program, Retro-

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<sup>14</sup> The 2006 Seattle Climate Action Plan and other related documents are available at <http://www.seattle.gov/climate/>.

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commissioning/Commissioning – Resource Conservation Manager, and Simple Compressor Rebates.

In February of 2008, the Mayor announced his Green Building Capital Initiative. He has since convened a Task Force to review policy options aimed at achieving a 20% reduction in energy consumption in existing residential and commercial buildings and in meeting the 2030 Challenge for new buildings. The Plan directly supports these goals, and for electricity efficiency establishes a base upon which the other policies can build.

Other climate-related activities that affect actions by City Light are mentioned in Section 3.3.

### 3.2 Building an Effective World-Class Organization

The planning, marketing, engineering, analysis and evaluation of energy efficiency programs require a complex and coordinated multidisciplinary effort. As shown in Figure 15 below, City Light uses a continuous improvement process to integrate these disciplines and ensure the programs' success.

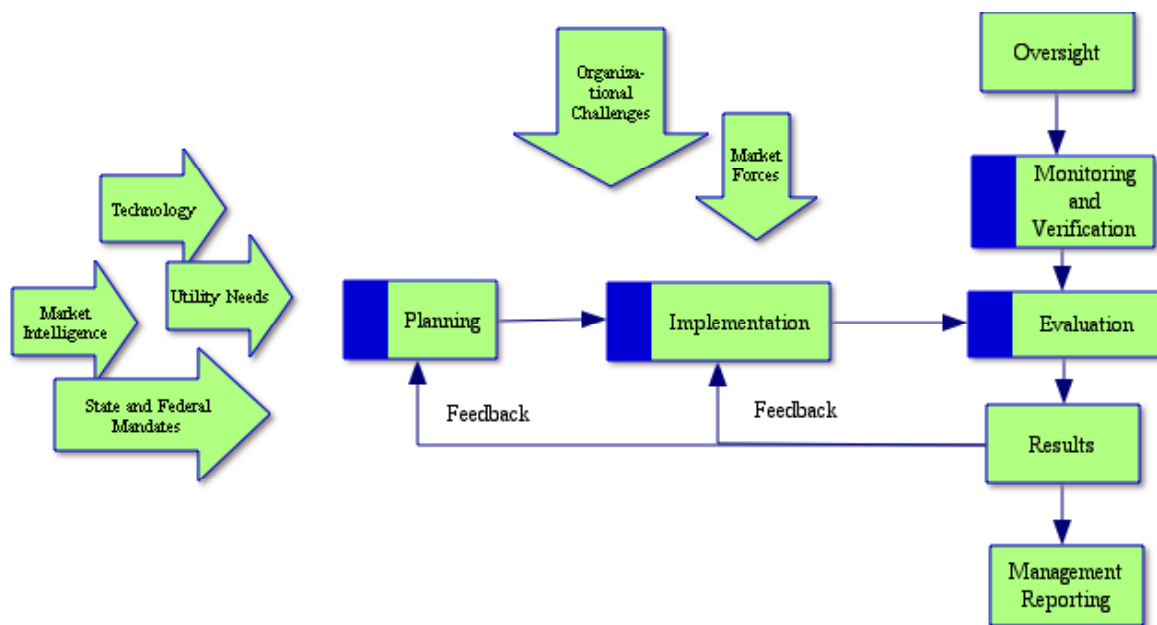


Figure 15: City Light Conservation Resource Division Continuous Improvement Process

#### **Program and Portfolio Planning**

Planning is the merger of technical analysis, market research and utility planning. The planning group must understand how customers use City Light's product (electricity,) and how that use is growing, both by individual customers and in the overall system. Once planners understand this,

*On-going and forward-looking -term planning is essential to our continued success*

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they must identify how to reduce consumption through pricing signals (rate design), technology or by altering customers' behavior.

Planners rely on market intelligence; technology assessment; experience with previous program successes and failures; utility requirements and costs; and regional commitments/standards/laws/regulations available for the optimization of program design.

Planners must use the data to identify specific goals, such as —reducing energy consumption or peak use, and changing time of use. For example, if the goal is to reduce the energy used for residential lighting by convincing customers to convert to compact fluorescent lighting, planners might provide incentives to reduce the products' price. That seems straight forward. Yet implementing such a "simple" idea requires the coordination of thousands of retailers, all with unique delivery channels and in-store processes.

## ***Program Implementation***

Program implementers base implementation plans on planners' program design requirements. Implementation plans must address several questions:

- Which set of customers is the program designed to serve with available resources?
- How many customers can be influenced in a specific period of time?
- Which is the best way to access those customers: individually or through mass marketing?
- How can City Light influence those customers most effectively: by —providing incentives to reduce the measure cost, providing point-of-sale rebates, educating customers about their options, or other approaches?

Once implementers determine how to influence the targeted customers to participate, they must develop successful sales strategies. They also must quantify outcomes, including the number of participants and the amount of energy savings, through evaluation, measurement and verification. These are discussed in **Section 5**.

## ***Program Marketing***

Marketing is a key element of program implementation.

Marketing has three critical roles:

- Effectively "sell" an individual program (Who is the audience? How do we get their attention? How do we get them to participate?)
- Coordinate marketing materials and delivery to ensure a consistent program message
- Effectively "brand" the program with a consistent identity.

City Light must effectively market its programs to at least five audiences: City of Seattle Conservation Resources Division, Seattle City Light staff, other City of Seattle departments, the residents of Seattle who own and are customers of City Light, and customers located in franchise cities the utility serves, such as Burien and Shoreline. In addition, City Light's energy efficiency

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program marketing must be consistent with and complement other City Light initiatives. More detail on program marketing can be found in Section 5.4.

### 3.3 Important Local, Regional and National Drivers

A number of key policy drivers have influenced the development of this plan.

#### **Local/Regional Climate-Related Initiatives**

As noted earlier, the City of Seattle is implementing a Climate Action Plan. The City has other climate initiatives, as described below. All of these programs affect and guide programs described in this *Five-year Conservation Action Plan*.

##### **Seattle Climate Action Now**

In September 2006, Mayor Greg Nickels launched the *Seattle Climate Action Now* (SCAN) campaign to encourage the residents of Seattle to achieve a net-zero greenhouse carbon footprint for the city. This initiative has three primary components: SeattleCAN.org, Climate Action Partners, and Community Action Days. City Light's proposed plan is consistent with the mayor's campaign.



*Seattle Climate Action Now*, [www.SeattleCAN.org](http://www.SeattleCAN.org): This website provides climate action tips to residents. It features information about what the City is doing in response to climate change; fact sheets; and free multilingual downloads, including the "Get Started Guide," "Reduce Poster," and "Seattle Climate Action Now Poster". Each item helps residents reduce their energy use and become more efficient, thereby, lowering their carbon footprint. City Light's energy efficiency programs will help customers achieve real energy savings. SCL staff estimates that for every kWh of energy saved by a City Light customer, 1.32 lbs of CO<sub>2</sub> are prevented from being emitted into the atmosphere.

***City Light residential programs help Seattle residents reduce emissions and save energy at home.***

*Climate Action Partners*: City Light is active in this network of over 70 business, community and nonprofit partners committed to increasing action to address climate change

*Community Action Days*: These events offer Seattle residents opportunities to take collective actions to increase their energy efficiency and reduce transportation-related greenhouse gas emissions.

These elements of the Mayor's Seattle Climate Action Now initiative will impact City Light's energy efficiency programs, primarily by increasing demand for such programs by residents and Climate Action Partners

##### **Climate Protection Agreement**

Since February 2005, the City of Seattle has committed to take the following three actions:

- Strive to meet or exceed the Kyoto Protocol carbon-reduction targets, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects and public information campaigns

***1.32 lbs of CO<sub>2</sub> Are avoided for Every kWh of Electricity saved***

- 
- Urge state and federal governments to enact policies and programs to meet or surpass the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol –(a seven percent reduction from 1990 levels by 2012)
  - Urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation to establish a national emission trading system.

### **Seattle City Light's Strategic Plan**

Seattle City Light recently completed its 2008 Strategic Plan. The Strategic Plan serves to provide the utility with a clear understanding of its electric power challenges and an approach toward addressing them. The Strategic Plan is comprehensive in its scope, identifying challenges and issues that exist for the electric power industry as a whole, regulation and governance related issues, and those that are specific to Seattle City Light.

The Strategic Plan provides the utility with a clear vision: to set the standard and deliver the best customer service experience in the nation. This vision guides the following five strategic priorities, from which several objectives and initiatives are defined:

- **To protect and enhance the environment** through choices in power supply, conservation efforts, daily operations, and environmental programs.
- **To strengthen and improve energy delivery infrastructure** so that it serves as a reliable platform for the increasingly complex customer interactions that will be expected of City Light, and so that it enables fully the City's economic and social development.
- **To develop a cost-efficient portfolio of power resources** that fills the needs of City Light's customers with a maximum efficiency while meeting all public policy requirements
- **To ensure that the utility is financially resilient** to protect its customers against the inevitable risks which arise from City Light's hydro dependence and from its many links to the broader power market.
- **To build on City Light's existing strengths in ways that transform the utility into a high-performance organization** – acting as an effective, well-supported team delivering superior customer service.

The objectives of the Five-Year Plan are supportive of the main priorities identified in the City Light's Strategic Plan. Increased conservation targets are consistent with the Strategic Plan's emphasis on environmental stewardship, financial resilience, and the development of a cost-effective resource portfolio that will help ensure the success and stability of City Light in the future.

### **The National Action Plan for Energy Efficiency**

In mid-2006, City Light Superintendent Jorge Carrasco collaborated with national energy leaders to initiate the National Action Plan for Energy Efficiency. This multi-year plan is intended to provide

*City Light's  
Conservation  
Action Plan  
builds upon the  
National Action  
Plan for Energy  
Efficiency.*



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policy “recommendations for a creating a sustainable, aggressive national commitment to energy efficiency through gas and electric utilities, utility regulators, and partner organizations. Such a commitment could save Americans billions of dollars on energy bills, over the next 10-15 years, contribute to energy security, and improve our environment.”<sup>15</sup> City Light’s *Five-year Conservation Action Plan* is consistent with the goals and practices discussed in this important national document. The City of Seattle and City Light already have met or are in the process of meeting 20 of 26 interim steps to implement the Action Plan’s Vision for 2025.

### **Washington State Initiative I-937**

In November 2006, the voters of Washington passed Initiative 937 (I-937), which requires utilities serving more than 25,000 retail customers to meet energy conservation and renewable resource targets. City Light has over 350,000 retail customers and therefore falls under the provisions of this legislation.

***The Five-year  
Conservation Action  
Plan will exceed the  
efficiency  
requirements under I-  
937.***

The legislation requires all utilities to determine their 10-year cost-effective conservation resource potential by January 1, 2010, and to review and update this assessment for the subsequent ten-year period at least every two years. As part of this process, City Light will establish a biennial conservation target, which is to be no less than a two-year pro rata share of the ten-year potential. Both the establishment of the conservation resource potential and the biennial conservation target must be consistent with the analytical methodology established by the Northwest Power and Conservation Council (NWPPCC).

The law and recently concluded rulemaking allows utilities three options in establishing its 10-year conservation target: conservation calculator, modified conservation calculator, and utility analysis. The conservation calculator option uses NWPPCC’s conservation calculator<sup>16</sup> to allocate the most recent Regional Power Plan (2005)’s conservation targets to individual utilities based on their share of regional retail load. The current version of the calculator estimates SCL’s energy conservation goals for 2010 through 2012 at 9.6, 10.0, and 10.3 aMW respectively. (See Figure 1.)

The modified conservation calculator option allows a utility to customize the calculator analysis by modifying key assumptions for its specific circumstances. The “utility analysis” option allows a utility to carry out its own detailed conservation potential assessment consistent with the NWPPCC’s methodology and certain prescribed assumptions. City Light will update its Conservation Potential Assessment in 2009, but until that work is completed it is not certain what energy savings targets will result from the Utility Analysis option. Given the flexibility allowed in determining compliance and the initial targets estimated by the conservation calculator method, City Light’s recommended conservation levels under the *Five-Year Action Plan* are expected to significantly exceed the minimum efficiency targets City Light will be obligated to meet under I-937.

I-937 also establishes an annual renewable energy target as a percentage of the utility’s average annual retail load. This requirement increases according to the following schedule: three percent by

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<sup>15</sup> *National Action Plan for Energy Efficiency* Document, Page ES-1, July 2006

<sup>16</sup> The calculator is available at <http://www.nwcouncil.org/energy/UtilityTarget.htm>

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2012 and through 2015; nine percent by 2016 through 2019; and 15 percent by 2020 and each year thereafter. Achieving the renewable resource targets is not typically the responsibility of the Conservation Resources Division. However, the Division does work with its customers to install renewable energy systems at their sites. City Light could own or contract for the associated renewable energy credits from these distributed renewable generation facilities. If the utility takes this step, it could earn a 2.0 multiplier credit under I-937 for the electricity output associated with these distributed systems.

### ***The Northwest Power and Conservation Council***

The Northwest Power and Conservation Council (NWPPCC), through authority granted by the 1980 Pacific Northwest Electric Power Planning and Conservation Act, is required to encourage energy efficiency in the Northwest and to develop a regional power plan. As in past plans, the Council's Fifth Power Plan, finalized in 2005, recommends that the region increase and sustain its efforts to secure cost-effective conservation immediately. The Council's analysis shows that improved energy efficiency costs less than the construction of new generation and provides a hedge against market, fuel and environmental risks. The Council estimates that energy efficiency could save up to 700 average megawatts in the Pacific Northwest between 2005 and 2009. As stated on the previous page, the Council's conservation calculator gives utilities a simple and affordable means to compute their share of the Fifth Power Plan's regional conservation target. Based on this pro-rata assignment, City Light's Five Year Plan exceeds the Council's suggested conservation targets<sup>17</sup>.

***This proposed  
City Light plan  
supports regional  
energy efficiency  
targets.***

### ***Bonneville Power Administration***

City Light purchases about 40 percent of its power from the Bonneville Power Administration (BPA). As a public preference wholesale power customer, City Light also is eligible for conservation funding from BPA, through which the utility essentially sells a share of its qualifying conservation achievements to BPA. This option will be available through September 2011, when BPA's current power sales contracts expire. Until then, BPA's funding mitigates the budget impacts of City Light's energy efficiency investments. However, accepting BPA conservation funding comes with a cost: a reduced ability to buy relatively inexpensive BPA power.

BPA funding takes two forms: the Conservation and Renewables Discount (C&RD) and a bilateral contract mechanism known as a Conservation Acquisition Agreement (CAA). With CAA funding, City Light's purchase rights through the end of the current power sales contract (2011) are reduced by 100 percent of the energy claimed (referred to as a decrement). There is no decrement associated with C&RD funding, but the amount of funding eligible through this mechanism is relatively small.

Both funding mechanisms affect City Light's access to BPA power after 2011. Through its Regional Dialogue process, BPA has established the framework for allocating relatively inexpensive (Tier 1) BPA power for new power sales contracts that will take effect in fiscal year 2012. Part of this

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<sup>17</sup> Noted as "I-937 Calculator" on Figure 1, pg. 4

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framework is a concept called the High Water Mark, which is the maximum amount of Tier 1 power that a utility is eligible to purchase. It is based on the difference between a utility's customer load and its firm generating resources. To help compensate for the fact that conservation inherently reduces customer loads, the High Water Mark allocation process includes a step giving credit to eligible conservation savings. If a utility takes BPA funding using either method (C&RD or CAA), the amount of those conservation savings it can claim is reduced by 25 percent, from 100 percent to 75 percent.

City Light will continue to evaluate the relative costs and benefits of taking BPA conservation funding and update its analysis every six months before each biennial report is due to BPA. Over time, BPA conservation funding through the CAA will become more attractive as the duration of the 100 percent decrement becomes shorter. However, if the utility's forecast of the long-term price or value of alternative power sources increases, then BPA funding and the associated loss of inexpensive BPA power will appear more costly, and therefore, less attractive.

BPA is on schedule to issue new long-term power purchase contracts in 2011. It is uncertain how BPA will deliver conservation programs to its utility customers at that time. For purposes of this plan it is assumed that City Light will receive the same BPA treatment in 2011 and 2012 as it did from 2008 through 2010.

### ***Congressional Action***

Federal legislation has and may in the future affect City Light's energy efficiency plans. New laws could include additional tax incentives for conservation investments, mandates for conservation investments like Washington's I-937 requirements, or carbon regulation (such as a cap-and-trade regulatory system or a tax on greenhouse gas emissions). City Light will monitor federal legislation actively and assess its impacts on energy efficiency programs, and the opportunities they provide for City Light and its customers

Recent relevant legislation includes the 2005 Energy Policy Act (EPACT) and the 2007 Energy Independence and Security Act (EISA). Among other provisions, EPACT set efficiency standards for 16 products and established short-lived tax incentives for a variety of energy conservation activities. Many of the tax incentives expired at the end of 2007 and were not included in the 2007 EISA, although they may be reauthorized during 2008. EISA set new efficiency standards for 10 products and directed DOE to initiate rulemaking on new standards for other products. Of particular note are performance standards for common light bulbs which phase in beginning in 2012, and which can be met by advanced incandescent lamps the major manufacturers are just introducing to the market. DOE is required to conduct a rulemaking to set standards to reduce energy use to no more than about 65% of current lamp use by 2020, a requirement likely to require use of compact fluorescent or LED technology. Other provisions of EISA address new labeling requirements for consumer electronics; funding of industrial efficiency programs; promotion of combined heat and power and district energy; and targeted research, development, and deployment of energy efficiency in commercial buildings.

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## **Race and Social Justice Initiative**

Inspired by the City of Seattle's Race and Social Justice Initiative<sup>18</sup>, City Light is working to be more sensitive to the needs of Seattle's multi-cultural and ethnically diverse communities, including new immigrants and refugees. City Light is committed to providing energy efficiency information and program access to the diverse and historically underserved communities and minority-owned businesses, and to providing programs in an effective and culturally relevant manner. In addition, City Light's outreach to the city's youth to promote environmental stewardship will plant the seeds for conservation "ambassadors" to lead the next generation.

*City Light is committed to delivering savings to disadvantaged communities.*

It will take innovative community engagement practices to overcome the cultural and linguistic challenges to reaching these diverse communities. For example, City Light has been extremely successful in marketing compact fluorescent lights (CFL); it has penetrated 70 percent of the market by installing at least one CFL in that proportion of Seattle homes. However, this indicates that almost three out of 10 homes still do not have at least one CFL installed, and the challenges in reaching these homes may be a result of cultural, language, and other barriers that will require creative communication techniques to reach and persuade those customers.

Effectively engaging these communities will achieve positive behavioral changes around energy efficiency and help achieved the goals of the Race and Social Justice Initiative. Improved outreach of access to conservation programs by the City's diverse communities will increase energy savings and save these customers money.

## **Green Jobs**

In his State of the City address in February 2008, Mayor Nickels outlined three priority items in making Seattle "America's Green Building Capital": improving energy efficiency in commercial and residential buildings by 20 percent, providing cost-savings for struggling homeowners through energy conservation measures, and creating new green collar jobs through investment in energy efficiency.<sup>19</sup> This call to action created an immediate need to understand the potential labor market demand for more green-collar jobs in the Energy Efficiency industry sector. Seattle Jobs Initiative (SJI) was tasked with conducting research to identify the green collar jobs associated with the Energy Efficiency industry as well as the current local demand for these jobs and the capacity of the local workforce system to meet this demand.

Recent national and local reports highlight how increased investment in energy efficiency programs and initiatives can result in the creation of several jobs and other economic benefits. A recent national report from the American Council for an Energy Efficient Economy (ACEEE) examined the benefits investments in energy efficiency had on local and national economies. The report concluded that energy efficiency can contribute to the growth of the economy, and that efficiency-led policies would likely increase the nation's GDP by 0.1 percent by 2030. In addition, the report

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<sup>18</sup> For information, visit <http://www.seattle.gov/mayor/issues/rsji/>.

<sup>19</sup> "Seattle No. 1 Green Building City in the Country" Press Release April 21, 2008.

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concluded that a 20 percent efficiency gain by 2030 would provide an estimated 800,000 net jobs, while a 30 percent efficiency improvement would generate as many as 1.3 million net jobs across the country.

To complement general Energy Efficiency sector job projections for the Seattle area, the Center of Wisconsin Strategy (COWS) was commissioned to model the specific job creation potential of direct investment into energy efficiency retrofitting for commercial buildings in Seattle over the next 5 years. The model used was based on construction estimation techniques, using budget information from City Light's Five-Year Plan. The overall findings indicate that for every \$1 million dollars invested in SCL's commercial retrofit programs (e.g., Energy Smart Services, Lighting Trade Ally Program, etc.), 7.37 job years are created. The majority of these jobs are projected to be entry-level (29%) and semi-skilled (36%) trades positions, such as carpenters, electricians, HVAC installers, and construction laborers. The full report, titled "Energy Efficiency Jobs and Training Opportunities for the City of Seattle," is included as Appendix E.

Additional research being done by SJI, the Washington State Workforce Training & Education Coordinating Board and other will further clarify the workforce needs associated with the growing "green sector" of the economy and Seattle's energy efficiency goals. However, initial studies clearly indicate that Seattle City Light's increased investments in energy efficiency as a part of the Five-Year Plan will have a positive effect on the number of green jobs in the local economy.

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## 4. 2008 - 2012 PROGRAMS AND EXPECTED RESULTS

### 4.1 Ability to Succeed---The “Engine must operate on all cylinders”

To obtain the exceptional performance outlined in this plan, all parts of the plan must work in synchronization. Increasing budget authority must accompany information and business systems and all must be delivered by the “human resource”. In a nutshell, budget commitment, organizational factors, staffing, information systems and program design and implementation must come together in a logical and sequential process. If any of these factors are slow to develop or get stuck in “bureaucracy”, the capabilities of this plan will not be fully achieved.

In the tables of **Appendix A**, we have identified the “confidence of success” of each individual program. The H for High, M for Medium and L for Low represent our confidence for each individual program to meet the expectations of energy savings represented in the individual program data sheets. These factors are based on such factors as experience with the program, confidence that we can “sell” the program to the necessary customers, and knowledge of the costs and savings of similar programs. For example, we have high confidence in our Energy Smart Services Commercial Retrofit program (#101), since we have been operating this program for many years, we know how and why customers participate in this program and we know the expected costs to deliver this program and the savings we will achieve. And, for example, we have low confidence in our Retail Big Box program since we have not previously undertaken a large scale retailer program with multiple products and rebate delivery mechanisms.

And, when we take all programs together, we have a high confidence in being able to deliver the overall performance of the portfolio of programs described herein.

The major factors that will impact our ability to succeed are:

**Budget Authority.** If Budget Authority is not increased the goals of this Action Plan will not be met. We need City Council budget authority for the 2009/2010 budgets contained within this plan to meet the goals of this plan. Reduction of Budget Authority will result in similar reduction of the goals of this plan. However, this is not necessarily one for one; we must rebuild the core competencies of planning, evaluation and verification, just to continue to deliver a base set of energy savings. Failure to increase the budget over current spending authorization will result in a deterioration of energy savings due to decreasing capabilities of staff and systems.

**Staffing.** Staffing is key to program implementation. Once budget authority is secured, competent staff must be obtained. This plan assumes that we can obtain competent staff, in a timely manner; see Table B-1 in Appendix B for the staff hiring schedule. However, all utilities in the Northwest and most nationally are increasing their conservation programs, so qualified staff will be hard to

*High Confidence in  
Success if Budget  
Authority, Staffing  
and Business  
Systems are  
committed*

find and harder to keep. Staff must be compensated accordingly and must be trained to meet the evolving needs of our changing customers.

**Systems.** New business systems must be identified and developed to improve processes and track and verify energy savings at both the program level and for the entire portfolio. We must have confidence in the savings being achieved by this plan. New systems must be thoughtful, well planned and timely executed for this plan to achieve the high level of savings envisioned.

When the three factors of budget, staff and systems are taken together, we have confidence in our ability to deliver the savings anticipated by this plan. However, delays in any one factor will delay the performance, and thus energy savings, of this plan. And, delays or reductions in any two will significantly impact Seattle City Light's ability to rely on Conservation as a resource and will require the utility to obtain much more costly power.

**Keys to Success**

- **Budget**
- **Staffing**
- **Systems**

**All must arrive  
"Just-in-time"**

## 4.2 Practical and Progressive Initiatives

The Conservation Resource Division has developed and improved on a unique portfolio of commercial, industrial, residential, renewable energy, multi-use or "other" programs. The "other" programs do not fit into these base categories or fit into more than one. The following section summarizes the existing and new programs City Light will offer in each of these categories in the period 2008-2012. Expected savings results of these programs are shown below in **Table 6**. More detailed expected savings results are provided in **Appendix A** and detailed program descriptions are provided in the Technical Appendix, **Appendix G**.

Expected Results - Program Sectors		Levelized Costs				
Number	Name	TRC B/C Ratio	TRC	Utility Program	First Year MWhs saved	% of total savings
100s	Commercial Programs	1.35	\$0.056	\$0.022	298,199	52.0%
200s	Industrial Programs	1.61	\$0.046	\$0.025	56,514	9.8%
300s & 400s	Residential & Mixed Use Programs	2.77	\$0.027	\$0.020	219,093	38.2%
	<b>Total</b>	<b>1.34</b>	<b>\$0.056</b>	<b>\$0.032</b>	<b>573,807</b>	<b>100.0%</b>

**Table 6: Expected Results by Program Sector**

## 4.3 Commercial Programs

Expected Results - Commercial Programs			Levelized \$/kWh			
Number	Name	TRC B/C Ratio	TRC	Utility Program	First Year MWhs saved	% of commercial sector savings
101	Energy Smart Services - Commercial Retrofit	1.15	\$0.067	\$0.023	92,189	30.9%
102	New Commercial - Whole Building	2.60	\$0.029	\$0.020	15,109	5.1%
103	Energy Smart Services - New Construction	1.83	\$0.041	\$0.031	22,232	7.5%
104	Grocery Store Initiative	3.06	\$0.023	\$0.012	6,325	2.1%
105	Smart Business	1.26	\$0.058	\$0.043	16,920	5.7%
106	Lighting Trade Ally Program	1.43	\$0.054	\$0.017	135,825	45.5%
107	Retro-Commissioning/ Commissioning	0.97	\$0.071	\$0.042	9,600	3.2%
108	Energy Efficient Data Centers	N/A	N/A	N/A	0	0.0%
109	Financing Options	N/A	N/A	N/A	0	0.0%
110	Energy Efficiency Fund (Public Sector Loans)	N/A	N/A	N/A	0	0.0%
	<b>Total</b>	<b>1.35</b>	<b>\$0.056</b>	<b>\$0.022</b>	<b>298,199</b>	<b>100.0%</b>

Table 7: Expected Results, Commercial Programs

### Existing Programs

**Energy Smart Services Commercial Retrofit (101)**—Program # in parenthesis will tie to program data sheet in the technical appendix – This resource acquisition program provides market transformation benefits to secure energy savings by upgrading buildings’ energy efficiency and implementing new technologies. The program consists of financial incentives for energy efficiency improvements of existing buildings and facilities, increasing energy efficiency awareness/education, developing a professional training series for utility staff and the commercial building industries, developing curricula for building certification aligned with City Light program services, and enhancing state and local energy codes.

**Energy Smart Services, New Construction (103)** – This program offers incentives for new construction that exceeds energy efficiency requirements of energy codes. Most measures are funded at 20 cents per first-year kWh savings. Funding is also available for energy analysis of high-efficiency design strategies by commissioning consultants selected and hired by the customer.

**Smart Business (105)** – This program provides incentives for small businesses to increase their energy efficiency. The program has focused on lighting; however, in 2008 City Light plans to expand the program to new construction, HVAC and other measures. The program has citywide and neighborhood-specific components. It is considered to resource acquisition and market transformation program.

### New Programs



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**Energy Smart Services, New Commercial – Whole Building (102)**– This is a new program to be utilized as a funding tool to target projects that incorporate energy efficiency measures to creative, cutting edge integrated (whole-building) design strategies for new commercial buildings that are being developed. It will provide energy savings analyses for design alternatives early in the design process. City Light staff will guide the customer not only on energy savings specifically, but on how to integrate energy analyses and results into the design process.

**Grocery Store Initiative (104)** – This program will provide refrigeration services to local grocery stores through a contract with Portland Energy Conservation, Inc. BPA will oversee the work, verify energy savings and pay PECEI to implement the program. City Light will provide incentives to customers based on the energy savings identified and delivered by PECEI.

**Lighting Trade Ally Program (106)** – This will be City Light’s single largest energy efficiency program. Using “best practices” research, it will leverage the lighting delivery chain to increase of the number of energy-efficient lighting projects in the commercial and industrial sectors. A senior program manager will work with an outside implementation contractor who will coordinate lighting trade allies, including contractors, distributors, manufacturers and specifiers. The program also will use the Lighting Design Lab; offer simple rebates; educate lighting allies; and manage program workflow, incentive levels and implementation and verification procedures.

**Retro-commissioning/Commissioning, Resource Conservation Manager (107)**– Through this customer outreach/customer service program, City Light will sign three-year contracts with Resource Conservation Managers who will work directly with utility customers to recommend and train them to implement “best practices” energy-efficiency measures regarding the commissioning<sup>20</sup> and retro-commissioning of their building’s operations and maintenance.

**Energy Efficient Data Centers (108)** – City Light will launch an effective and credible program focusing on servers and data centers – facilities that house computer systems. The program will engage in utility and other consortiums focused on data center efficiency and conservation. The aim of the program is to focus on delivering two types of measures: *technology-based* and *design-based measures* by offering competitive incentives for installation.

**Financing Options (109)** – Through this program City Light will facilitate private funding for energy efficiency upgrades beyond what our existing conservation programs provide. This could include all sectors. The major commercial sector component will likely be modeled after the Clinton Climate Initiative.

**Energy Efficiency Fund (Public Sector Loans ) (110)** – This program will provide funds for City Light to lend City Departments and other public agencies the balance of the cost of energy efficiency upgrades not covered by City Light’s commercial retrofit program. The agency will repay

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<sup>20</sup> ASHRAE Guideline 0, *The Commissioning Process*, defines commissioning as “a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria”. <http://www.wbdg.org/project/buildingcomm.php> Accessed February 14, 2008.

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SCL the loan principal and its cost of borrowing (currently 5.5% for first lien dept). The repayment schedule will be shorter than the expected life of the installed conservation measures but long enough so that the agency's costs of electricity and loan repayment should be less than its previous costs of electricity. It is expected loan repayment terms could range from 5 to 10 years.

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<sup>22</sup> "Monitoring and verification" (M&V) is also known as "measurement and verification," "measurement and validation," and "monitoring and validation" by other various organizations.

## 4.4 Industrial Programs

Expected Results - Industrial Programs			Levelized \$/kWh			
Number	Name	TRC B/C Ratio	TRC	Utility Program	First Year MWhs saved	% of industrial sector savings
201	Energy Smart Services - Industrial	1.60	\$0.046	\$0.025	55,714	98.6%
202	Simple Compressor Rebates	2.07	\$0.036	\$0.019	800	1.4%
	<b>Total</b>	<b>1.61</b>	<b>\$0.046</b>	<b>\$0.025</b>	<b>56,514</b>	<b>100.0%</b>

Table 8: Expected Results, Industrial Programs

### **Existing Program**

*Energy Smart Services (ESS) Industrial (201)* – This resource acquisition program provides market transformation benefits through financial incentives and technical assistance to existing and new construction industrial facilities. The program consists of an energy survey done by the Conservation Resources Division, an energy analysis study and payments of up to 70 percent of project costs. Measures include lighting, compressed air system, electric furnace, and refrigeration upgrades; variable-speed drives (VSD); controls; galvanizing tank insulation and temperature control; and premium efficiency motors.

### **New Program**

*Simple Compressor Rebates (202)* – under the proposed program, City Light will provide rebates to customers that install Variable Speed Drives (VSDs) on their compressed air processing systems. Typically, these are found in industrial, food processing, auto repair shops, and medical facilities. Air compressor upgrades have often been overlooked in efficiency programs because they were not cost-effective prior to VSDs. As a result, this program will capture potential market that has previously been under-served.

## 4.5 Residential Programs

Expected Results - Residential Programs			Levelized \$/kWh			
Number	Name	TRC B/C Ratio	TRC	Utility Program	First Year MWhs saved	% of residential sector savings
302	Multifamily New Construction - Built Smart	2.65	\$0.031	\$0.031	12,610	5.8%
303	Common Area Lighting	1.75	\$0.042	\$0.034	3,000	1.4%
304	Multifamily Weatherization	1.08	\$0.083	\$0.028	5,551	2.5%
305	CFL Retail Program - Twist and Save	5.82	\$0.012	\$0.008	164,050	75.4%
306	Wash Wise	1.15	\$0.065	\$0.017	5,106	2.3%
307	Refrigerator Recycling	2.23	\$0.030	\$0.030	11,609	5.3%
308	Residential Lighting	5.01	\$0.014	\$0.014	9,583	4.4%
309	Neighborhood Power Project	N/A	N/A	N/A	0	0.0%
310	Low Income - Single and Multifamily	0.78	\$0.116	\$0.116	4,585	2.1%
311	Retail Big Box	1.16	\$0.064	\$0.049	1,600	0.7%
312	In Home Monitors	N/A	N/A	N/A	0	0.0%
313	Home Audits/ Home Use Support	N/A	N/A	N/A	0	0.0%
314	LEED For New Homes	N/A	N/A	N/A	0	0.0%
	<b>Total</b>	<b>2.79</b>	<b>\$0.026</b>	<b>\$0.019</b>	<b>217,694</b>	<b>100.0%</b>

Table 9: Expected Results, Residential Programs

### Existing Programs

**Multifamily New Construction, Built Smart (302)** – This program provides funding and technical assistance to multifamily building developers that exceed the energy code or standard practice in the construction of buildings. To qualify, a development must have five or more residential units that receive energy efficiency upgrades. The program emphasizes:

- Market-rate and affordable-housing projects with electric heat and stick-frame construction, which are eligible for upgrades for shell measures such as windows and insulation
- Any other multifamily projects, such as concrete-and-steel high-rises and gas-heated buildings, or projects eligible for but which do not to take funding for shell measures, which may receive rebates for lighting and other optional measures.

**Common Area Lighting (303)** – This rebate program provides incentives for lighting efficiency upgrades in “common areas” of existing apartment buildings and condominiums. It covers 85 percent of the retrofit project costs.

**Multifamily Weatherization (304)** – This rebate program provides incentives for upgrading to more efficient windows, and adding ceiling, under-floor and wall insulation. It features a simplified

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application and review process and paperwork, and requires no up-front customer agreement. Although primarily a resource acquisition program, it has some market transformation features, such as educating the multifamily sector about the benefits of energy efficiency and encouraging mainstream adoption of thermal performance metrics.

***CFL Retail Program (Twist & Save) (305)*** – This program increases sales of CFL bulbs by using a retailer markdown model, rather than the coupon-based approach used by some utilities. It aims to provide greater flexibility in pricing and more accurate monitoring of sales.

***WashWise (306)*** – WashWise is a collaborative retail appliance rebate program offered by City Light, Seattle Public Utilities (Saving Water Partnership), Puget Sound Energy, Cascade Water Alliance, Tacoma Power and Tacoma Water. Rebates of \$50, \$75 and \$100 are offered for machines that meet performance standards established by the Consortium for Energy Efficiency (CEE). Rebate costs are split evenly between electric and water utilities.

***Refrigerator Recycling (307)*** – This turnkey contractor-operated program collects and recycles second refrigerators and freezers from residential customers. Customers are offered a \$30 rebate per appliance. The appliances are recycled and the ozone-depleting materials are captured and recycled or destroyed.

***Residential Lighting (308)*** – In addition to Twist & Save, City Light pursues several other strategies to encourage adoption of efficient residential lighting, including distributing CFLs; participating in regional CFL retail programs most of which are sponsored by BPA; and a Puget Sound-area \$20 lighting fixture rebate program.

***Neighborhood Power Project (309)*** – This program targets one neighborhood per year, from July to June, to encourage energy and resource conservation in collaboration with other City departments, neighborhood organizations and volunteers. It serves as a platform for delivery of other energy conservation programs and the majority of the energy savings it contributes to are accounted for in other programs. Program elements include green audits, free CFLs for residential customers, workshops and presentations. City Light promotes resource acquisition programs such as Smart Business and the multifamily retrofit programs through targeted direct mail and coordinated staff follow-up. Smart Business provides a bonus incentive for neighborhood businesses that convert to energy-efficient practices.

***Low Income (310)*** – City Light funds low-income energy conservation projects through the Office of Housing's HomeWise program. City Light funding may be used for electric conservation measures in single- and multifamily projects.

## **New Programs**

***Retail Big Box (311)*** – This program will focus on the retail sector to encourage the purchase and installation of a variety of energy efficiency measures, including appliances (such as dishwashers and refrigerators), water- and energy-savings fixtures, efficient water- and space-heating technologies, and insulation and efficient windows. Other mechanisms, such as existing new construction and retrofit programs, will also be explored.

*In Home Monitors (312)* – This program will encourage residential customers to adopt new technologies to monitor their energy consumption in real-time. Based on recent studies, this monitoring is expected to reduce energy consumption. A pilot program will be implemented in 2008; if the results are positive, it will be expanded. Future implementation of Advanced Metering Infrastructure (AMI) may provide additional opportunities for collection and communication of customer consumption data.

*Residential Home Audits/ Home Use Support (313)* – In 2008 and 2009 City Light will pursue a pilot program to use Web or direct mail customer communications to encourage energy savings. If results are positive, the program will be expanded.

*New Single-Family Homes (314)* – City Light will explore options to increase energy efficiency in new single-family construction, including the ENERGY STAR® Homes Northwest program being implemented by the Northwest Energy Efficiency Alliance, and LEED for New Single-Family Homes. City Light will specifically assess whether a Seattle-specific equivalent to LEED would be more effective in our market.

## 4.6 Multi-Use Specialized Programs

Expected Results - Mixed Use Programs			Levelized \$/kWh			
Number	Name	TRC B/C Ratio	TRC	Utility Program	First Year MWhs saved	% of mixed use sector savings
401	Mixed Use New Construction	1.56	\$0.053	\$0.049	1,399	100.0%
	<i>Total</i>	<i>1.56</i>	<i>\$0.053</i>	<i>\$0.049</i>	<i>1,399</i>	<i>100.0%</i>

Table 10: Expected Results, Mixed-use Programs

### ***New Program***

*Mixed Use New Construction Program (401)* – This program will offer rebates for commercial new construction (Energy Smart Services), small businesses (Smart Business), and multifamily residential programs (Built Smart) for “mixed-use” developments that apply the industry’s “best practices” for energy-efficient technologies. Measures will include, but not be limited to: ultra-low-E windows, high-efficiency appliances and space heating, CFL fixtures, and high-efficiency central chiller plants. Simple rebates will be developed and “deemed” savings will be used where applicable.

*For Completeness of the Conservation Resources Division 5 Year Action Plan, Renewable and Other programs are included with budget and staffing requirements, but do not contribute directly to energy savings goals.*

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## 4.7 Renewable Energy Programs

### ***Existing Program***

*Green Power, Small Scale Renewables (501)* – This program supports local renewable demonstration projects and provides educational assistance to the community. Customers pay an extra fee on their bill to help fund these projects.

*Green Up (502)* – Through this program, the Department sells “tags” to interested ratepayers, which cover all the costs of specific renewable energy projects. At this time, Green Up “tags” support only the Stateline Wind project. Surplus revenue funds other renewable projects.

### ***New Programs***

*On-site Renewable Power and Cogeneration Program (503)* – This program will provide support and engineering for commercial and industrial customers exploring the installation of on-site renewable power. A new member of City Light’s Commercial and Industrial Sector team will help owners and developers with the technical and financial aspects of on-site renewable energy production. A July 2008 study conducted by Ecos Consulting showed a large amount of potential for renewable power and cogeneration in City Light’s territory, with eight specific opportunities recommended for immediate action with the potential to generate 39 million kWh annually.

*Small Scale Renewables, Residential Focus Incentive Program (504)* – This program could provide residential and small-commercial customers with incentives above and beyond the current WA State renewable energy production incentive program. Under this program City Light could purchase the renewable energy credits (RECs) from customers. This additional incentive program could accelerate the adoption of solar PV technology and potentially assist the Department in meeting its renewable energy target under Initiative 937.

*Small Scale Renewables, Washington State Incentive Program (505)* – This program will be offered in response to Substitute Senate Bill 5101, adopted in 2005. The legislation gives electric utilities the opportunity to provide annual payments to customers for energy produced from their renewable energy projects. This program will provide the State-based incentive, as well as workshops, educational materials and appropriate technical assistance.

*Home Power Program with Financing (506)* – City Light will investigate a program meant to provide financing to the residential sector either “on bill” or through third-party providers. Incentives will include the installation of energy-efficient appliances, air conditioners, windows, additional insulation and photovoltaic (and possibly solar thermal) systems. This program could be expanded to small business customers.

In order to more effectively guide customer renewable activity, City Light is in the process of developing a Small Scale Renewables Action Plan to guide its efforts in small scale renewables, with a particular emphasis on solar installations. This plan takes into account the many state and national mandates, incentives, and new programs designed to support increased installations of small scale renewable energy and will develop an action plan for the near future for related

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programs (programs 501, 502, 504 and 505). The plan will cover City Light's internal actions and program development in addition to external factors such as RPS requirements, RECs, federal grants like the Solar America Cities Initiative (of which the City is a recipient), Washington State's Renewable Energy Production Incentive, and new funding for green job programs.

## 4.8 Other Programs

### ***Existing Programs***

***Green Building Team (602)*** – This program will deliver energy savings from commercial new construction projects by paying for one FTE on the Department of Planning and Development's Green Building Team and support initiatives defined by a Memorandum of Agreement (MOA). The FTE will bring new commercial projects to the Energy Smart Services (ESS) program; funding also may support ESS customer incentives.

***Lighting Design Lab (603)*** – The Lighting Design Lab (LDL) is the region's showcase for cutting-edge lighting technology. Seattle City Light's Conservation Resources Division manages and staffs LDL. The Lab plays an important role in leading this region's commercial lighting market-transformation effort and demonstrates the viability of energy-efficient technology.

***Northwest Energy Efficiency Alliance (604)*** – This program funds City Light's participation in the Northwest Energy Efficiency Alliance (NEEA). NEEA is a 10-year-old regional non-profit organization that transforms energy-use markets in the Northwest. The Alliance is funded by regional utilities, BPA and Energy Trust of Oregon. Major successes include regional penetration of compact fluorescent lamps and the commercial design program called "Better Bricks".

***Seattle Energy Code (605)*** – The energy code is a regulatory effort funded by City Light and administered by the City's Department of Planning and Development (DPD). City Light provides technical assistance to DPD on energy matters. The next iteration(s) of the Seattle Energy Code will likely reflect the Mayor's climate-related activities. City Light will respond to any relative requirements.

### ***New Programs***

***Demand Response Residential and Commercial (601)*** - This new program will plan and implement one or two pilot demand response programs for the residential and commercial sectors. The program will study customer savings, technology and rate design solutions, and impacts and benefits to specific distribution feeder circuits.

***Infrastructure Energy Efficiency Improvements (607)*** - This section includes several current and proposed energy efficiency programs such as energy efficiency at substation lighting within Seattle, Seattle City streetlight energy efficiency upgrades, and residential unit energy efficiency upgrades for the Skagit power plant residential units. For purposes of this plan, staffing and incentives will be covered under the individual and appropriate programs such as Energy Smart



Services for commercial and institutional programs and residential weatherization for the home efforts on the Skagit.

## 4.9 Sensitivities

This plan focuses on the budget, staffing and systems necessary to deliver the recommended path in this Plan. For purposes of sensitivity analysis we have developed and analyzed two alternative scenarios. The first aims to address the question of how the economics of the recommended plan are affected if budget and staff are approved but the energy savings goals are not met because of lower than planned customer participation. The second analyzes a less aggressive path which captures the available cost-effective energy savings potential less rapidly.

**Case #1: "Lack of customer participation"**. In this case, the recommended resources of budget, staffing and systems are approved and are implemented as scheduled, but customer participation only provides 80% of the planned energy savings. All labor, marketing and administration costs are equal to the base plan, but energy savings and associated incentive payments are only 80% of the recommended path. Also under this case, customer financial incentives per unit of energy savings are assumed to increase by an additional 10% in 2011 and 2012 (above the 10% increase in those years assumed for the base case Five Year Plan) in an attempt to generate additional customer participation.

The results of this case are presented in Table 6 below. As expected, the net benefits and benefit/cost ratio for each perspective are lower than those for the recommended path, since the fixed costs of conservation programs are still fully committed and the benefits are lower. Additional extrapolation of these results show that energy savings could be as low as 50% of planned levels until the total costs borne by customers and the utility exceeded the benefits.

Utility Program Perspective		Dollars in Millions	Nat'l Leadership
Avoided Power (Benefit to Utility)		\$398.4	
Program Costs (Costs to Utility)		(\$180.7)	
Net Benefit to Utility		<b>\$217.7</b>	<b>\$274.1</b>
Utility Benefit/Cost Ratio		<b>2.21</b>	<b>2.38</b>
Participating Customer Perspective			
Customer Bill Savings (Benefit to Customer)		\$260.8	
Customer Conservation Cost (Cost to Customer)		(\$110.2)	
Net Benefits to Customer		<b>\$150.6</b>	<b>\$169.3</b>
Customer Benefit/Cost Ratio		<b>2.37</b>	<b>2.20</b>
Service Territory Perspective (Total Resource Cost)			
Avoided Power (Benefit to Service Territory)		\$398.4	
Total Costs (Utility + Customer Conservation)		(\$300.8)	
Net Benefit to Service Territory		<b>\$97.6</b>	<b>\$120.7</b>
Service Territory Benefit/Cost Ratio		<b>1.32</b>	<b>1.34</b>

Table 11: Case 1, 80% Participation  
30 Year Analysis -- 2008\$ (NPV)

Case #2: "Reduced Budget and Staff". Under this case, the budget increase approved is only 50% of the recommended path, staffing increases are limited to the 11 new positions required to "rebuild core competencies", and energy savings goals are reduced accordingly, reaching just over 11 aMW in 2011 and 2012. Customer incentives, staffing costs are reduced accordingly. The results, presented in Table 7, show 10% lower utility net benefits due to the slower pace of acquiring cost-effective energy savings, as well as lower customer net benefits.

Utility Program Perspective		Dollars in Millions	Nat'l Leadership
Avoided Power (Benefit to Utility)		\$403.8	<b>\$274.1</b> <b>2.38</b>
Program Costs (Costs to Utility)		(\$168.4)	
Net Benefit to Utility		<b>\$235.4</b>	
Utility Benefit/Cost Ratio		<b>2.40</b>	
Participating Customer Perspective			
Customer Bill Savings (Benefit to Customer)		\$265.4	<b>\$169.3</b> <b>2.20</b>
Customer Conservation Cost (Cost to Customer)		(\$113.1)	
Net Benefits to Customer		<b>\$152.3</b>	
Customer Benefit/Cost Ratio		<b>2.35</b>	
Service Territory Perspective (Total Resource Cost)			
Avoided Power (Benefit to Service Territory)		\$403.8	<b>\$120.7</b> <b>1.34</b>
Total Costs (Utility + Customer Conservation)		(\$291.0)	
Net Benefit to Service Territory		<b>\$112.8</b>	
Service Territory Benefit/Cost Ratio		<b>1.39</b>	

Table 12: Case 2, Reduced Budget & Staff  
30 Year Analysis -- 2008 \$ (NPV)

#### Sensitivity Summary Table

	Incremental First-Year Savings through 2012 (aMW)	Ave \$/MWhr	TRC B/C Ratio	Total Resource Cost Net Benefits (NPV)
Base Case	65.5	\$37.40	1.34	\$120.7M
Sensitivity Case #1	52.4	\$42.84	1.32	\$97.6M
Sensitivity Case #2	52.4	\$36.67	1.39	\$112.8M

5 Year savings are cumulative savings summed over the 5 year period.  
Ave \$ per MWhr assumes 10 year average program life.

Figure 16 below recreates Figure 1 and includes the first-year energy savings assumed for cases 1 and 2.

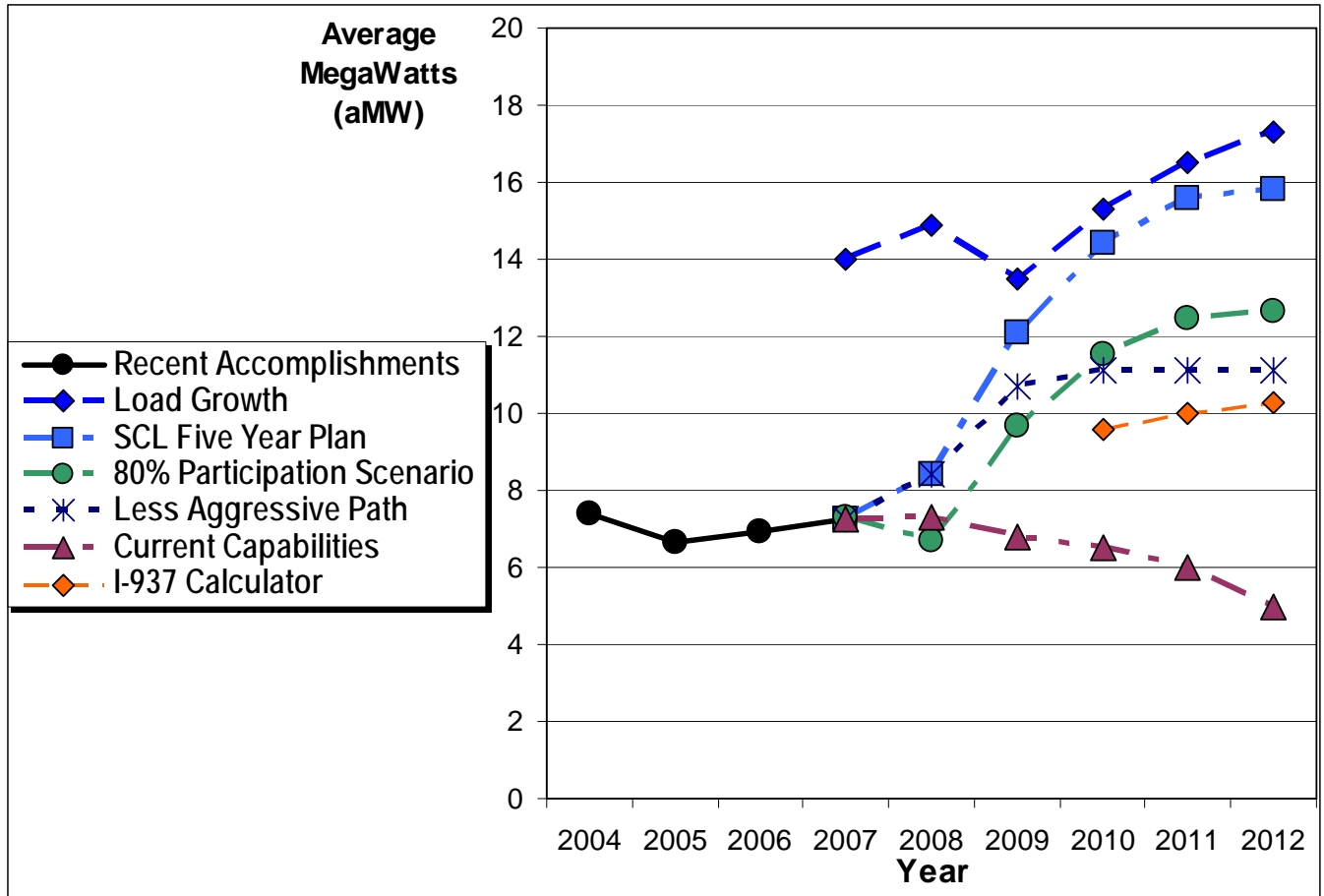


Figure 16: Cases 1 & 2

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## 5. REBUILDING THE SEATTLE CITY LIGHT CONSERVATION INFRASTRUCTURE

As highlighted during the City Light internal Current State Assessment process, six important areas of the City Light conservation infrastructure need substantial re-investment in order to ensure the reliability of the utility's conservation power plant.

- **Human Resource** -- City Light's most valuable asset, its people, are the face of its programs and the energy that will drive the utility forward.
- **Monitoring and Verification** -- This quality control function provides on-going data from in-field metering and inspections that City Light uses to verify energy savings estimates.
- **Planning, Research, and Evaluation** -- This strategic function provides the forward-looking thinking the organization needs to fine-tune, expand, or phase out existing programs, and to identify new opportunities for achieving conservation resource goals.
- **Marketing** -- This essential function defines City Light's conservation brand and implements specific strategies and tactics to ensure that program participation is sufficient to meet long-term goals.
- **Information Management** -- City Light Information Management functions, including customer and program-level tracking of activities and results, form the basis for reporting functions as well as ongoing marketing efforts to capture available energy savings.
- **Organizational Structure** -- To meet core infrastructure needs, and to address issues identified during the Current State Assessment, a slightly modified and expanded organizational structure is proposed.

A detailed description of the investments planned for each of these areas is provided below.

### 5.1 The Human Resource

City Light's human resource is its most valuable asset for delivering energy efficiency. The *Current State Assessment* highlighted several important issues, including the need for succession planning, proactive recruiting, a review of city pay and classification structures and a clear definition of career paths. City Light staff has established the following priorities in this area:

**Planning for a smooth transition** – The City Light workforce is aging; nearly 60 percent of staff will be eligible to retire within five years. Transition planning, including the passing of institutional knowledge, is a key element of an organizational development strategy. Wherever possible, City Light plans to work with current staff to identify anticipated retirement dates. Other actions include:

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- Overstaffing key positions to ensure a smooth transfer of institutional knowledge from current staff to their successors
  - Implementing a job shadow effort.

***Recruiting and training a new generation of staff*** -- When City Light started its Conservation Resources Division, it tapped into a generation that was eager to make a difference in the world. Going forward, the utility will aggressively recruit and train new staff for planning, evaluation and implementation roles. There is a critical shortage of skilled energy services professionals, and tremendous local, regional and national competition for experienced staff. To achieve this priority, City Light will:

- Build relationships with key colleges and universities
- Develop and actively promote an internship program
- Hire and train recent college graduates with degrees in economics, business, engineering, environmental studies and public policy
- Design and implement a training program for internal staff.

***Ensure competitive pay scales*** -- Creating a culture where existing staff feel they are valued will require offering competitive financial and non-financial opportunities. Since City Light operates within the city structure, pay scales historically have been aligned with the City's pay structure. Cost-containment efforts have limited the number of City Light's "pockets", and there is competition for all of them. While this structure has had merit in the past, it does not give City Light the flexibility it needs to develop and maintain a world-class organization. A salary survey is under way; recommendations from this study will be incorporated into the plan.

***Establish clear career paths*** -- Job classifications will be reviewed and redefined as necessary to ensure sufficient mobility within the Division to enable staff to work where they can be most effective and successful. Specific steps to improve this area include:

- Revise job pockets into broad classifications -- This will enable City Light to attract and retain talent by providing a clear career path for professionals in the organization. Examples include:
  - Modifying the Energy Management Analyst (EMA) position to include four levels (*Assistant EMA, EMA, Senior EMA and Principal EMA*) to encompass all field operations positions within the Division.
  - Creating an "*Engineer*" family of classifications, to include *Assistant Engineer, Engineer* and *Senior Engineer* to supplement the *Energy Management Analyst* job classification series.
  - Creating a *Business Solutions Account Manager* classification to provide solutions to customers and customer segments and who will manage outside contractors responsible for implementing specific program elements.
- Create positions for *Project Manager* and *Senior Project Manager*, who will manage outside contractors responsible for implementing specific program elements.
- Create market-based pay bands for each of the above classifications.

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## 5.2 Monitoring and Verification

City Light intends to re-emphasize the monitoring and verification<sup>22</sup>(M&V) of energy efficiency savings. The goal of this re-emphasis is to further reduce the uncertainty associated with increasingly complex energy efficiency projects and provide more reliable results. This will involve substantial new investments in M&V management policies and practices. Since it is imperative that M&V management processes be as transparent and objective as possible, City Light will develop a concise M&V management plan that will include the utility's M&V goals and objectives, documentation of policies and processes as well as the implementation of a third-party monitoring and verification process.

*City Light will place a renewed emphasis on independent monitoring and verification of savings.*

The new M&V function will be developed in three phases:

- Phase 1 (4<sup>th</sup> Qtr 2008): Begin full M&V review of existing programs and best practices; charter the M&V function; develop M&V Management and Implementation Plan; construct RFP for third-party M&V support (program design contractor on board)
- Phase 2 (1<sup>st</sup> Qtr 2009): Develop specific M&V requirements for City Light; Implement enhancements to program M&V practices; Initiate contract for third-party M&V services and reporting
- Phase 3 (2<sup>nd</sup> Qtr 2009): Complete implementation of the M&V Management Plan and incorporation of M&V policies and processes into the sector workplans and programs

To ensure that the utility's M&V goals and objectives are met, a new Conservation Resources Division M&V organizational structure has been created that centers on a senior-level strategic advisor reporting directly to the Division Director. This organization structure reflects the importance of and independence from the program implementation process as well as the team approach and commitment. This position will have a defined reporting relationship with specific procedures and methodologies to City Light's Financial Services Business Unit, which will provide a further means of independent verification of program energy savings.

M&V is a team function. The M&V strategic advisor will lead a team, which includes planning and evaluation staff, program managers, implementation contractors and the third party M&V contractor, to define and share objectives for specific programs, including identifying program milestones and targeting goals. The M&V strategic advisor, with assistance from the team, will prepare specific M&V protocols and procedures aligned with industry standards.

The resulting program-specific M&V plans will include the following:

- *Scope and schedule:* What will be done and when it will be completed
- *Verification:* How the Energy Conservation Measure (ECM) performance will be verified and who will conduct the activities
- *Sampling:* What sampling size is statistically valid and cost-effective to implement
- *Methodology:* How the energy savings and load impacts will be calculated
- *Reporting:* How performance will be adjusted to account for variables.

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Standardized national and international M&V protocols will be used as the basis for M&V protocols. Four of the most common M&V protocols are:

- **The International Performance Measurement and Verification Protocol (IPMVP)** The IPMVP is the successor to the North American Measurement and Verification Protocol sponsored by the U.S. Department of Energy (DOE).
- **Measurement and Verification Guideline for Federal Energy Projects (FEMP)**
- **ASHRAE Guideline on Measuring Energy and Demand Savings** (<http://resourcecenter.ashrae.org>)
- **Efficiency Valuation Organization (EVO)** (<http://www.evo-world.org/>)

***Standardized M & V protocols will be used to provide methods of measuring savings or demand***

### **5.3 Planning, Research, and Evaluation**

The complexity of building and maintaining an effective energy-efficient “power plant” requires a sophisticated set of *planning, research, and evaluation* infrastructure capabilities that will serve as a cornerstone for City Light’s continuous improvement goal. Planning involves the strategic assessment of energy efficiency options and forecasting of impacts; research enables City Light to stay on top of emerging technology opportunities, customer needs and decision-making; and evaluation entails rigorous review, monitoring and verification of program impacts and other information that can be rolled back into the planning process..

In the past, City Light had very strong capabilities in this area. Over the past decade, however, staffing and budget cuts have diminished many of these capabilities. As noted in the Current State Assessment<sup>24</sup>, this lack of in-house capability, if not rectified, will hamper City Light’s ability to meet increased energy efficiency goals. Many other utilities are in a similar situation, where once-strong planning, research, and evaluation functions were scaled back. Ironically, most if not all, of these utilities now are trying to rebuild these capabilities. City Light must invest substantial resources to ensure that its planning, research and evaluation infrastructure supports its drive to implement the most effective energy efficiency initiatives.

Specific needs in this area include the following:

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<sup>24</sup> The *Current State Assessment* was completed for City Light by Energy Market Innovations, Inc. on June 1, 2007.

- Re-establish City Light's Planning, Research, and Evaluation Group
- Develop a structured planning, research and evaluation process
- Implement priority research and evaluation projects
- Implement and evaluate pilot programs

## **Re-establish City Light's Conservation Planning, Research and Evaluation Function**

Nationally, utilities spend an average of 5 percent of their annual energy conservation budget on planning, research and evaluation. City Light has, over the past five years dedicated, less than 2 percent of its budget to these areas. City Light must re-invest in this function, including the development of new staff and technical expertise. To underscore the importance of this function, City Light will hire a senior-level Manager of Planning, Research, and Evaluation (PR&E).

As planned, the PR&E function will include 13 professional staff and a senior-level manager reporting to the Director. This organization will develop and own processes for long-term strategic planning, annual program planning and budgeting, program evaluation and market research.

Specific activities for which this group will be responsible include:

- **Updating Five-year Conservation Action Plans and Annual Plans and Budgets** -- developing and recommending annual updates to this *Five-year Conservation Action Plan* and the annual program plan and budget. This process will be transparent, with formalized opportunities for staff/stakeholder review and input.
- **Annual Conservation Resources Division Program Planning and Budgeting** -- developing and implementing an annual planning process. This process will include structured facilitation with program managers to provide detailed program implementation plans and document program savings and budget assumptions.
- **Annual planning for program evaluation** -- identifying and prioritizing the Division's evaluation needs, and communicate the results of these efforts to Division staff.
- **Annual planning for market research** -- identifying and prioritizing specific program, technology and market research needs, and communicating the results of these efforts to Division staff.
- **Conducting program evaluations** -- managing program evaluation contractors.
- **New program development** -- designing new program initiatives.
- **Pilot program implementation and evaluation** -- designing, managing and evaluating pilot programs intended to verify a variety of factors of possible interest such as program delivery methods, energy savings, or market potential.

In addition, the group will be responsible for a variety of regular and *ad hoc* reporting functions, including:

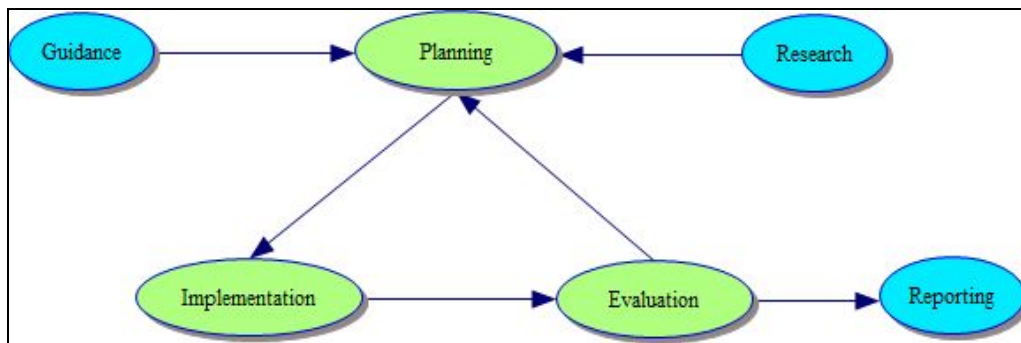
*City Light will re-invest in its planning and evaluation organization.*



- Program summaries and audits
- CITY LIGHT annual report Input
- FERC EIA-861, an annual report on energy savings and spending
- Energy accomplishments update
- Regional reporting (BPA, NWPCC, and RTF)

## **Development of a Structured Planning, Research and Evaluation Process**

The CSA identified the need to formalize many SCL CRD processes to give staff and stakeholders a transparent program planning and decision-making process. A simplified planning and evaluation process is shown in **Figure 17**. In this figure, strategic guidance and research inform the planning process and program implementation and evaluation. Results are reported to management and fed back into the planning process.



**Figure 17: Simplified Planning and Evaluation Process**

Important elements of this process will include:

- **Utilization of a standardized analysis platform** - This model will serve as a warehouse for customer data, technology impacts and benefit/cost analyses. City Light has bought a model for this purpose, and staff will be trained to use it.
- **Annual review of program evaluation results** – Results from evaluation efforts will be used in an on-going fashion. In addition, a formal annual review will inventory and track evaluation results and recommendations and report on how these results are used for program planning and/or implementation.
- **Annual program budgeting process** -- Annual program budgets will be developed from the bottom-up, based on fresh assumptions. As part of this process, the PR&E group will compare current- and previous-year budgets; list customer incentives, and staffing, marketing and administrative costs; and calculate the program's cost-effectiveness.

As a matter of policy, all Conservation Resources Division energy efficiency programs will be evaluated annually to identify any program performance issues quickly and effectively. Evaluation projects will be shaped by the overall scope and need. In order to determine each program's unique evaluation needs, the PR&E group will identify and document (with input from the division's

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management, program managers/staff and stakeholders) program-specific issues that are significant to program performance. The group will prioritize these using the risk-based process described below.

City Light's energy efficiency programs and measures span a range of maturity, markets, market penetration, and complexity. The PR&E group will use a risk assessment process to drive evaluation planning activities. The process will identify the elements of risk that are relevant to each program or proposed program; assess the relative degree of risk posed by each of these risk elements to the savings goals of each program or proposed program; and prioritize each program's planning and evaluation needs. This process will incorporate quantitative and qualitative assessment of the following elements of risk:

- **Technical/Economic Risk** - Includes examining key areas of savings and cost, and economic analyses and/or measurement and verification of savings
- **Market Risk** - Includes analysis of external issues that influence program planning and implementation
- **Organizational Risk** - Acknowledges organizational issues that may have an impact on the efficiency with which SCL can secure energy savings.

Within the evaluation plan, PR&E will develop a "rapid feedback" evaluation process to support any need for interim and actionable reviews of program performance and identify opportunities to maximize performance through program design or implementation efforts. This will be a collaborative effort between PR&E and the specific program(s).

### ***Implement Priority Research and Evaluation Projects***

The Division is in the process of identifying and developing additional future research and evaluation needs. This will result in a list of near-, mid-, and long-term priorities including long-term evaluations of savings, market-focused research designed to understand customer opportunities for energy efficiency, and related decision-making constraints. For 2008, the highest priority will be updating the impact evaluation for the Energy Smart Services Program.

## **5.4 Program Marketing**

As mentioned in **Section 3.2**, a key element of program implementation is marketing. For the Conservation Resources Division, marketing is the means to inform and motivate customers and/or trade allies to take actions to use energy more efficiently. It is essential to maintain adequate marketing resources and creative marketing capabilities.

For a utility, marketing is particularly complex, as it faces both broad (the utility "brand") and narrow (individual program/technologies) marketing challenges within a diverse service area. **Table 13** identifies the audiences City Light must identify, characterize, target and influence – and do so with limited resources.

Sector	Residential	Commercial New Construction	Commercial Retrofit	Industrial Retrofit
Audiences	<ul style="list-style-type: none"> <li>• Single-family Homeowners</li> <li>• Single-family Tenants</li> <li>• Multifamily Owners</li> <li>• Multifamily Property Managers</li> <li>• Multifamily Tenants</li> <li>• Big Box Retailers</li> <li>• Community Groups</li> <li>• Trade Associations</li> <li>• Architects</li> <li>• Builders</li> <li>• Developers</li> <li>• Lighting Distributors</li> <li>• Lighting Contractors</li> <li>• Code Officials</li> <li>• Low-income Agencies</li> <li>• Weatherization Contractors</li> <li>• Regional Partners (e.g., utilities, BPA)</li> </ul>	<ul style="list-style-type: none"> <li>• Property Owners</li> <li>• Property Developers</li> <li>• Architects</li> <li>• Mechanical Engineers</li> <li>• Electrical Engineers</li> <li>• General Contractors</li> <li>• HVAC Distributors</li> <li>• HVAC Manufacturers</li> <li>• HVAC Contractors</li> <li>• Lighting Manufacturers</li> <li>• Lighting Distributors</li> <li>• Lighting Contractors</li> <li>• Trade Associations</li> <li>• Code Officials</li> <li>• Regional Partners (e.g., utilities, BPA)</li> </ul>	<ul style="list-style-type: none"> <li>• CEOs and CFOs</li> <li>• Facility Managers</li> <li>• Facility Engineers</li> <li>• Architects</li> <li>• Mechanical Engineers</li> <li>• Electrical Engineers</li> <li>• General Contractors</li> <li>• HVAC Distributors</li> <li>• HVAC Manufacturers</li> <li>• HVAC Contractors</li> <li>• Lighting Manufacturers</li> <li>• Lighting Distributors</li> <li>• Lighting Contractors</li> <li>• Trade Associations</li> <li>• Code Officials</li> <li>• Regional Partners (e.g., utilities, BPA)</li> </ul>	<ul style="list-style-type: none"> <li>• CEOs</li> <li>• CFOs</li> <li>• Facility Managers</li> <li>• Facility Engineers</li> <li>• Architects</li> <li>• Mechanical Engineers</li> <li>• Electrical Engineers</li> <li>• General Contractors</li> <li>• HVAC Distributors</li> <li>• HVAC Manufacturers</li> <li>• HVAC Contractors</li> <li>• Lighting Manufacturers</li> <li>• Lighting Distributors</li> <li>• Lighting Contractors</li> <li>• Trade Associations</li> <li>• Code Officials</li> <li>• Regional Partners (e.g., utilities, BPA)</li> </ul>

**Table 13: Key Audiences for Energy Efficiency Programs by Sector**

The *Current State Assessment* sought to analyze the division's marketing resources and capabilities; understand the strengths and weaknesses of staff, customers, and program stakeholders; and evaluate industry best practices. The results of the *Current State Assessment* include:

- There has been a lack of City Light senior management leadership and support for marketing.
- Management must focus on marketing to leverage and improve staff skills (e.g., through leadership and sales training).
- City Light must re-invest in marketing capabilities to strengthen its brand by proactively communicating successful City Light and Conservation Resources Division projects and experiences.
- Energy savings successes will increase through *targeted* awareness campaigns.
- City Light must do much more to reach and affect underserved markets.
- There is a lack of current, useable market data and, therefore a need to significantly improve market intelligence by capitalizing on staff knowledge and existing databases.
- Marketing efforts are increasingly cooperative/collaborative, with improved information sharing and collaboration among Commercial/Industrial and Community Conservation staff.
- Staff understands the value of reaching out to trade allies and is interested in leveraging larger political initiatives.
- The division has a proven ability to develop media/events/campaigns and respond to the expressed needs of program implementation staff.

In sum, marketing has not been perceived as a core strength of the Conservation Resources Division. City Light is not alone in this. Traditionally, utilities have been most effective at broad-

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based marketing efforts that target the residential sector and less able to understand the nuances required to influence transactions on a measure level. It is City Light's challenge to develop a marketing team that works creatively across sectors and understands the strategic dimensions of each. Fortunately, City Light's existing staff has significant marketing and creative assets. The utility must leverage that capability as it develops an appropriate marketing infrastructure.

Industry "best practices" have given City Light a proven foundation upon which to build the marketing infrastructure and define the following core strategies of a Strategic Marketing Plan:

- Customer focus
- Alignment with external drivers (e.g. *Seattle Climate Action Plan*, I-937)
- Specific goals (portfolio, sector and program level)
- Specific target audiences
- Aligned program channels to provide sufficient access to the target audience
- Appropriate, motivational messages
- Effective delivery methods for all marketing materials.

There is significant opportunity for more effective marketing across all market sectors and segments. In the absence of multimillion-dollar budgets for extensive media campaigns, the division's Marketing Group must devote its resources to market intelligence, training and creative use of technology, and create and sustain relationships that prove most vital to City Light's strategic interests. The Division has defined the following actions to achieve those purposes.

- ***Redefine the City Light energy efficiency brand*** – In 2008 City Light will solicit a qualified firm to help redefine the Conservation Resource Division and City Light brands. The successful outcome of this project will require:
  - An understanding of City Light's history
  - Sophisticated analysis of the value of energy efficiency to the utility and its constituents
  - An assessment of the strengths and limitations of City Light's existing brand
  - An ability to define a brand and marketing message(s) that will function effectively at the portfolio, sector and programmatic levels for the foreseeable future.
- ***Developing market intelligence infrastructure*** – The division's staff has an enormous amount of experience with the markets they serve and has high-quality relationships/contacts within these markets. The *Current State Assessment* revealed, however, that these valuable organizational resources often are "silo-ed" and underutilized. Therefore, an immediate priority will be to develop a market intelligence infrastructure that will involve and benefit City Light's planning, evaluation, implementation and third-party stakeholder groups. This will include:
  - Performance Dashboards -- These indicators reflect -- by market segment, rate class, neighborhood and/or measure -- the market size and estimated market penetration rates.

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- Current, usable and assessable contact management database -- This will allow City Light to communicate with all customers, trade allies, industry observers, trade associations and industry groups and get the right information to the right decision-maker at the right time in the right form in order to influence outcomes.

City Light must invest significant resources and specific expertise to develop, maintain and use this infrastructure effectively.

- ***Develop strategic peer-to-peer marketing*** – City Light's long-term success depends on the quality and quantity of the relationships the division has with City Light customers. The findings from the Current State Assessment and review of Industry Best Practices indicate that decision-makers value direct contact from staff at equivalent levels within City Light. Examples of this contact include:
  - A facility manager wants information from a Conservation Resource Division peer who helps problem-solve technology or system-centric issues.
  - A CEO is interested in information from a City Light executive to articulate how energy efficiency can positively affect their longer-term business plan.
  - The sales manager of a lighting distributor is interested in understanding how City Light programs can motivate and benefit his/her sales staff.
  - A multifamily property manager is interested in information that will demonstrate how energy efficiency can increase rent levels or improve tenant retention.

To address this need, peer-to-peer marketing efforts will focus on the following levels:

- *Executive*
- *Financial*
- *Measure and system (e.g., replacement, specification)*
- *Facility management*
- *Trade ally*
- *Owner*

Developing City Light's capacity to market effectively to these groups will require up-to-date market intelligence, useable marketing collateral, and -- in many cases -- sales and/or customer service training for the division's staff.

- ***Optimizing relationships with trade allies*** -- The success of these programs is directly dependent on the quality and quantity of City Light's relationships with trade allies. Firms that interact with City Light's customers every day are most familiar with their facilities, and whose *business* is installing the efficient equipment/systems City Light incents, often are best able to influence purchasing decisions related to energy efficiency.

City Light's programs cannot thrive unless it works actively and creatively with trade allies to:

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- Understand their business models
  - Articulate how Conservation Resource Division interests converge with theirs
  - Create program processes and marketing messages that support their business.

The Pareto Principle suggests that, in any market segment, 20 percent of market actors are responsible for 80 percent of all market activity. Sound marketing strategy requires focusing the utility's limited marketing resources on the 20 percent that are most active in its service territory. Efforts to develop, nurture and sustain these interactions will involve:

- One-on-one staff contact
  - Training and education seminars
  - Forums and open houses, nurturing collaborative research and development opportunities, sponsoring regional events.
- ***Provide leadership within local, regional and National energy professional communities*** -- There is an opportunity for City Light to take a more proactive role in professional associations and networks related to energy efficiency. While City Light has participated in some of these organizations and associations for a long time, it has been less active in them recently. It is essential to reinvigorate a presence in and make substantive contributions to these organizations to demonstrate to these key groups that City Light is a committed, attentive and active community leader.
  - ***Develop information technology and information dissemination capacity*** – City Light customers use various new technologies to access, use and share information. For instance, 73 percent of adults use the Internet regularly. In order for the Conservation Resource Division to be a viable, competitive and valued resource to City Light's constituents, the utility must make a major commitment to and investment in new communication technologies. Two areas warrant immediate attention:
    - *Conservation Resource Division website* – While the current website is of some value to some customers, unfortunately it is of limited value to most. This department, at this time, and in this center of high-tech innovation, needs state-of-the-art Web capability to provide new and useful content quickly and effectively. Doing so will involve an exploration and adoption of industry best practices and the hiring of a Web master.
    - *Social marketing research*. Important social marketing research will influence how City Light markets its messages and programs. In this emerging age of on-line communities and social networks, City Light will develop new means of describing program benefits, reducing barriers, persuading decision-makers and inviting participation through existing and emerging channels. This may be especially important in reaching diverse communities that have not shared equitably in the benefits of conservation.

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## 5.5 Business Systems--Information Management

Many of the current business systems used by the Conservation Resources Division are dated and carry a high level of risk and a lack of confidence. Many of our tracking tools are spreadsheet based with only one or two staff members able to input or retrieve data. The possibility for data entry and/or extrapolation errors exists.

We have unsophisticated systems for tracking customer performance. We cannot tell if a customer may have participated in an energy efficiency program at some time in the past and we certainly do not have tools to predict if that customer might participate in a new program being designed for the future.

Finally, as our program content nearly doubles, we need the necessary tracking tools to monitor and track individual program performance and then to be able to "roll up" all of the programs into an overall "portfolio" performance. This will be the "output meter" of our virtual conservation power plant.

To this end we are proposing development of an Information Strategy Plan (ISP) to be developed in conjunction with Seattle City Light IT division. The basics of this plan are discussed below.

### ***Project Goal***

To create and formalize a strategic information management framework that defines information projects that supports the ability of City Light employees to carry out the mission of this 5 Year Action Plan for conserving energy resources by the citizens of Seattle.

For budgeting purposes, the 5 Year Action plan has identified \$2.6 million from 2009 to 2011 to plan for and implement such a system. Its justification and specification will occur throughout the ISP process.

### ***Project Objectives***

- Build on existing information systems and programs within the division;
- Create or take advantage of existing City technology tools;
- Leverage the organizational benefit of 'dashboards' as communication tools;
- Address information management needs of the organization; and
- Address effective and efficient ways of managing information based on technological and program innovations.

### ***Desired Project Outcomes***

- A comprehensive information vision to guide Division information decisions;
- A method of communicating tools and technology identified from the ISP development process;
- Documented and articulated key information issues from which to frame near- and long-term information investments;

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- Key strategies for addressing information issues supported by a strong information and analytic base;
  - Improvement recommendations for the allocation of IT and programmatic resources;
  - Recommendations for establishing and/or strengthening organization structure for making information management investment decisions;
  - Assessment of IT assets including leveraging of information management existing tools; and
  - Development of implementation plans for short- and medium-term information projects

### ***Background – the role of information in an energy conservation organization***

Information management has evolved from its roots as an automated reporting medium to a mission critical tool that enables an organization to learn from itself and create and foster a dynamic knowledge base. As conservation organizations have seen the need or have been forced to address energy issues more holistically, (i.e. IRP-based management, multiple measures-based management, and performance-based management approaches) the requirement for more complete and diverse information has arisen. The management of information has grown quickly from a responsibility of information technologists to the responsibility of all employees. Leading-edge conservation managers and professionals are seeing themselves less as auditors and program managers and more as managers of information.

As the perception and value of information has changed from commodity to strategic asset, conservation organizations are now choosing to manage both information and its related business processes as enterprise functions. As such, business leaders are including information management as a major factor in strategic planning, budgeting, program planning, partnership negotiations and performance metrics (programmatic and employee). As enterprise information initiatives, even small in scope, can be expected to require significant business process changes, business leaders are addressing information management issues both technically and organizationally.

The Conservation Resource Division, in conjunction with the City Light IT division proposes to develop an Information Strategy Plan (ISP) as the organizing document for future investment decisions about information, its integration, and its management. This ISP will document the division's overarching vision for information integration and management and information goals, objectives, and key strategies. The objective of this plan is to apply this vision and goals to short- and long-term information strategic directions, information processes supporting decision-making, and sound technical decisions and support.

One likely and significant outcome of the process is the purchase or development of a single comprehensive program tracking and reporting system for the division that will allow for more effectively tracking of program results relative to energy savings goals and other measurable performance objectives. Ideally such a system will be integrated with utility billing and metering systems (including any future Advanced Metering Infrastructure systems), incorporate strategic market research data, and provide contact management capabilities.



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## ***ISP Project goal, objectives, and anticipated outcomes***

The development of an ISP is more than the creation of a high-level planning document. This Division-wide endeavor will require significant resource investments and technical and organizational decisions comparable to its strategic scope and value. The CRD Director sponsors this project, giving it his highest priority. With the Director's leadership, the Division's Planning and Evaluation function will oversee this effort and the following aggressive project goal, objectives and outcomes:

### ***High-Level information needs***

Most high-level information needs of CRD are not well documented. The Division, through the 5 Year Plan Current State Assessment identified its basic information needs and requirements. In some areas, the Division has documented more specific needs. Based on the results of past need identification efforts and national best practices, the ISP project identified the following high-level list of needs:

- Integrated access to information across medias and between CRD, key partners, and Trade Allies;
- Integrated place-based analysis and management;
- Coordinated support and funding of information systems planning;
- Document management capabilities for cataloging documents and linking to current and future processes;
- Coordinated organizational and business driven approach for information and information technology investments;
- Standardized set of report generation tools;
- Reduce unnecessary duplicative data entry and management efforts between medias;
- Easy sharing, translation, or reporting;
- Provide access of appropriate data to the public;
- Provide electronic submittal of documents;
- Fully integrate field personnel;
- Support high-level management information needs; and
- Management level information access tools (such as metrics dashboards as management tools)

These needs, taken singularly, represent significant steps towards building the necessary information foundation to support the Division. As a whole, they are the elements of a vision for better decision-making. As information projects and approaches are proposed, outlined, and analyzed, they will be related back to this list of needs to ensure consistency, relevance, and appropriateness. All information projects and approaches developed in this plan will be designed to assist in addressing CRD's information needs.

### ***Project methodology and framework***

The objective of the CRD ISP project methodology is to support the Division in carrying out an information planning and implementation process that results in broad agreement on near- and long-term strategic information directions, information processes needed to support environmental

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decision-making, and sound technical architecture decisions and support. The design methodology will be guided by the following principles:

- **An integrated approach**, centered on a robust strategic information planning and data management needs process, to ensure information management choices are consistent with Division and City goals, objectives, and organizational processes. The approach appropriately links the separate technical, institutional, and culture aspects of the Division and sets up strategic decisions in a logical and efficient sequence.
- **A flexible approach** tailored to the needs and culture of CRD. This background is used to assist CRD in critically evaluating and selecting an information direction best suited to *its* needs and circumstances.
- **A commitment to build the capacity for the change process.** Strategic information planning and implementation are continuous improvement activities. This project is designed to help CRD build its institutional capacity to carry out these activities successfully.
- **An emphasis on Division participation and stakeholder involvement.** Many strategic information planning and implementation efforts fail due to the lack of sufficient participation by affected staff, stakeholders, and other key persons. An ISP supported by only a “thin slice” of the Division will lack both valuable input and the buy-in necessary for successful implementation, and will meet resistance (or simply be ignored) by line staff and external parties. This design methodology fosters the participation necessary for a meaningful outcome, without becoming blocked by those with intransigent positions or bogged down by unnecessary procedural steps.
- **An emphasis on strong analysis and supporting information.** To be effective, strategic information thinking and implementation must not only involve the right people, it must be informed by insightful and provocative information that stimulates long-term thinking, focuses that thinking on critical issues, helps participants understand the pros and cons of key strategic choices, and is directed at achieving meaningful results.

## ***ISP Plan Organization***

The ISP organization is proposed as follows:

- **Section 1** Conservation issues, mandates, functions, and Division goals outlining the high level priorities, business and information drivers that frame both information needs and investment decisions;
- **Section 2** Information baseline and analysis section that summarizes current information management-centered organizational and technical infrastructure. This section will include an annotated list of high-level information issues that need to be addressed strategically;
- **Section 3** As framed by the Division’s priorities and drivers, these high-level information issues will be addressed and opportunities formulated based on current national best practices as directed and constrained by CRD priorities and resources;

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- **Section 4** These opportunities will be further refined in a strategic projects analysis section that addresses organizational, business process, and technology issues and considerations for identified information projects; and
  - **Section 5** Specific information management recommendations including implementation plans for short- and medium-term information projects.

### ***ISP Plan Timeline***

The Division sees the development of an Information Strategic Plan as a mission critical element of its 5 Year Action Plan. The development of the plan will take place during calendar year 2008 to support investment decisions in the 2009 budget process.

## **5.6 Organizational Design**

To support planned efforts to rebuild core competencies, expand existing programs, and develop and implement new programs, CRD must reposition and expand its organizational structure. This initiative will address several deficiencies that were highlighted in the Current State Assessment.

Below is the revised organization chart showing the organization at build out. 28 new positions have been added. New working teams have been added to the Commercial and Industrial section. New Planning and Marketing sections have been added.

Behind the Org Chart is a task list of activities specifically required to “rebuild core competencies”, “expand existing programs”, and to “develop and implement new programs.”

Even more detail is provided in Section 6.1 outlining the budget, staffing and other resource needs required to implement the Five Year Plan’s course of action.

## Organizational Structure

A functional view of this proposed organizational structure is shown in Figure 18.

Function Organization Chart:  
SCL Conservation Resources Division  
Aug 26, 2008

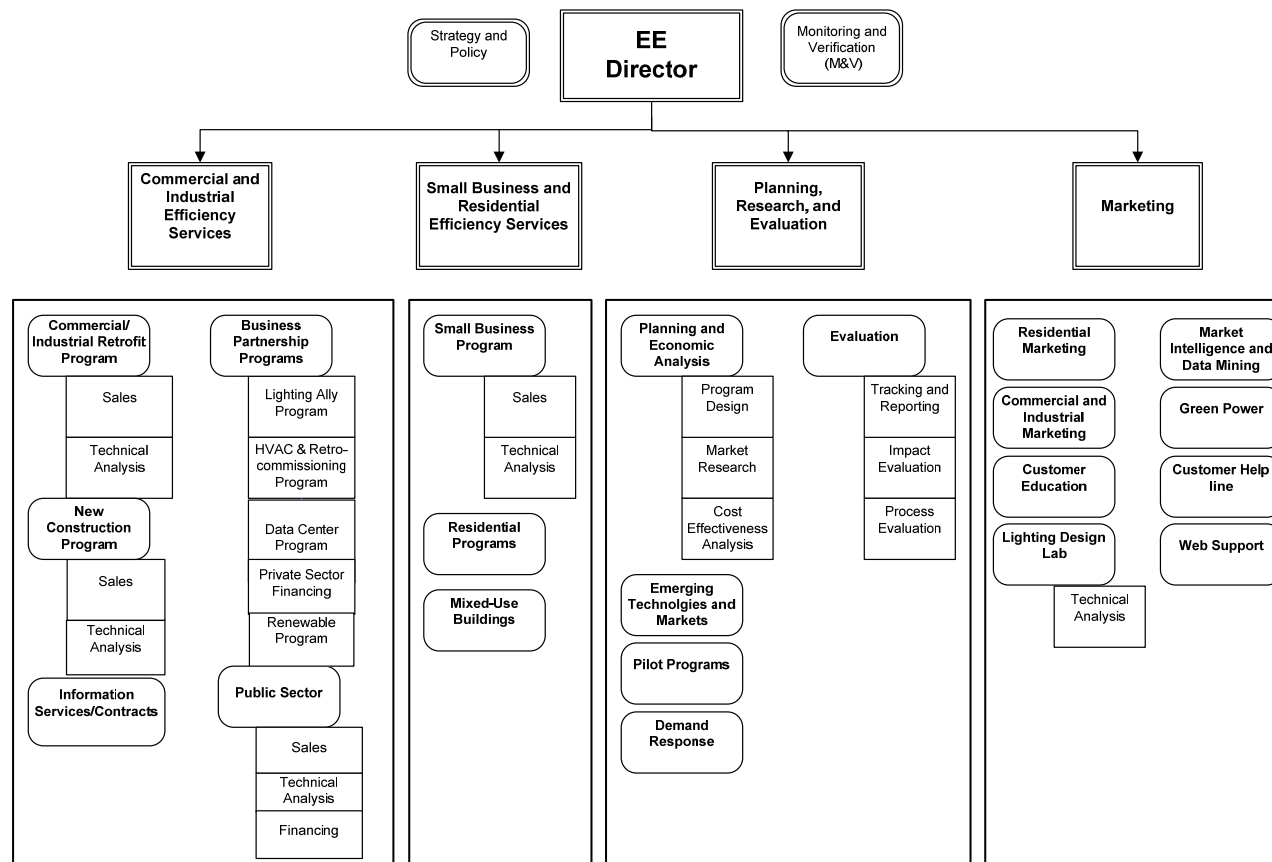


Figure 18: City Light Conservation Resources Division Functional Organizational Structure

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## **Staffing Requirements**

### ***Rebuild Core Competencies***

In order to rebuild its core competencies, CRD plans to seek authorization and recruit for the following ten *new* positions:

- One Community Conservation Manager
- One M&V Contract Manager (Strategic Advisor)
- Three new Planning Analysts
- One Economist
- Two new Marketing Analysts – one for C/I and one for Web Support
- One new Demand Response Analyst
- One new Green-Up Commercial Analyst

### ***Expand Existing Programs***

In order to have the capability to expand existing programs as outlined in this plan, CRD plans to seek authorization and recruit for the following six *new* positions:

- C&I Team
  - One Lighting Program Manager (Account Executive)
  - One Data Center/Server Farm Program Manager (Account Executive)
  - One HVAC & Retrocommissioning Program Manager (Account Executive)
- Residential Team
  - One Contract Manager (Account Executive)
- Two Process and Impact Evaluation Analysts

### ***Develop and Implement New Programs***

In order to have the capability to develop and implement new programs as outlined in this plan, City Light plans to seek authorization and recruit for the following 12 *new* positions:

- C&I Team
  - One Resource Conservation Manager (Account Executive)
  - One C&I Public and Private Sector Loan Program Manager (Account Executive)
- Residential Team
  - One Mixed-Use Program Manager (Account Executive)
  - One Smart Business Supervisor
  - One Program Evaluation Supervisor
  - One Emerging Technology Analyst
  - One Pilot Programs Manager
  - One Planning Analyst
  - One Home Power / Solar Program Manager
  - Two Lighting Lab Trainer/Analysts

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- One On-site Power Program Manager

A detailed presentation of the planned organization from an FTE perspective is provided in **Appendix B**.

## 6. SUMMARY: ACTION ITEMS

### 6.1 Resource Needs: Budget and Staffing

Table 14 presents the proposed budget authorization required to carry out the Five Year Plan. It is broken out by year, and then by program sector or functional category. Appendix A includes additional budget detail by sector and by program summed for the entire five-year planning period. Appendix F, part of the separately bound Technical Appendix, breaks out budgets by year and by individual program or functional area. Note that budget projections do not include offsetting revenue of approximately \$10.2 million, loan repayments of \$1.4 million, and labor loadings and Administrative & General Expenses of \$40.1 million.

Budget Projections								
Number	Sector/Function	2008	2009	2010	2011	2012	5-Yr Total	% of 5-Yr Total
100s	Commercial Programs	\$7,158,488	\$15,549,635	\$15,957,133	\$19,119,681	\$20,081,755	\$77,866,693	41.8%
200s	Industrial Programs	\$1,716,876	\$2,397,645	\$3,147,081	\$3,769,073	\$3,955,658	\$14,986,334	8.3%
300s	Residential Programs	\$6,402,269	\$7,560,051	\$7,503,168	\$8,051,819	\$8,105,611	\$37,622,917	20.2%
400s	Mixed Use Programs	\$0	\$141,526	\$168,933	\$197,868	\$202,839	\$711,165	0.4%
500s	Renewable Programs	\$320,823	\$907,645	\$1,272,557	\$1,344,881	\$1,763,359	\$5,609,265	3.0%
600s	Other Programs	\$1,955,848	\$2,485,728	\$2,839,761	\$2,963,654	\$3,036,863	\$13,281,854	7.1%
701	Infrastructure: Management	\$768,767	\$893,765	\$917,005	\$958,237	\$983,151	\$4,520,924	2.4%
702	Infrastructure: Support	\$501,683	\$519,242	\$532,744	\$546,595	\$560,807	\$2,661,071	1.4%
703	Infrastructure: Planning & Evaluation	\$1,227,743	\$2,070,742	\$3,236,489	\$3,395,755	\$3,480,151	\$13,410,880	7.2%
704	Infrastructure: Information Mgmt	\$0	\$512,000	\$1,575,000	\$524,442	\$0	\$2,611,442	1.4%
705	Infrastructure: Intern Program	\$0	\$200,000	\$210,000	\$215,103	\$220,330	\$845,433	0.5%
706	Infrastructure: Marketing	\$324,904	\$690,792	\$849,613	\$878,074	\$899,929	\$3,643,313	2.0%
707	Infrastructure: Miscellaneous	\$380,000	\$790,428	\$883,586	\$905,057	\$927,050	\$3,886,121	2.1%
708	Infrastructure: M&V	\$0	\$1,087,589	\$1,089,866	\$1,116,503	\$1,143,790	\$4,437,748	2.4%
	<b>Total</b>	<b>\$20,757,402</b>	<b>\$35,806,787</b>	<b>\$40,182,936</b>	<b>\$43,986,740</b>	<b>\$45,361,294</b>	<b>\$186,095,159</b>	<b>100.0%</b>

Table 14: Budget Projections, 2008-2012

Several key assumptions were used in developing the proposed budgets presented here. They include:

- All figures are in nominal dollars and all costs are inflated by 2.43% per year, consistent with the utility's current average inflation forecast for the time period covered by the Plan.
- Where appropriate, customer financial incentives increase by 10% over inflation beginning in 2011 to support increasingly aggressive program goals and greater program penetration.
- Some staff salaries are assumed to increase by 10% over inflation beginning in 2011.
- The budget requirements have been broken out by deferred O&M and regular O&M categories for the purpose of the 2009 and 2010 budget submittal, although that information is not included in the Plan.

Table 15 summarizes the positions being requested to support implementation of the Five Year Plan. They are presented by year and by program sector or functional category. Additional detail regarding existing staffing levels and the assignment of specific new positions to program areas or functional areas are found in **Appendix B**.

Staffing Projections (FTEs)						
Number	Name	2008	2009	2010	2011	2012
100s	Commercial Programs	17.0	22.0	23.0	23.0	23.0
200s	Industrial Programs	7.0	7.0	7.0	7.0	7.0
300s	Residential Programs	9.0	10.0	10.0	10.0	10.0
400s	Mixed Use Programs	0.0	1.0	1.0	1.0	1.0
500s	Renewable Programs	1.0	4.0	4.0	4.0	4.0
600s	Other Programs	6.0	8.0	9.0	9.0	9.0
701	Infrastructure: Management	8.0	9.0	9.0	9.0	9.0
702	Infrastructure: Support	10.0	10.0	10.0	10.0	10.0
703	Infrastructure: Planning & Evaluation	3.0	10.0	13.0	13.0	13.0
706	Infrastructure: Marketing	2.0	4.0	4.0	4.0	4.0
708	Infrastructure: M&V	0.0	1.0	1.0	1.0	1.0
	<b>Total</b>	<b>63.0</b>	<b>86.0</b>	<b>91.0</b>	<b>91.0</b>	<b>91.0</b>

Table 15: Staffing Needs (FTEs), 2008-2012

## 6.2 2008 Action Items

The actions that follow will be taken by SCL CRD during 2008. This list is divided by functions of the division and where appropriate organized by additional major categories including Staffing, Programs, and Projects.

### **Commercial and Industrial Section**

#### Programs

- Continue the Commercial and Industrial Section's Energy Smart Services Retrofit and New Construction Program



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- Implement and begin to deliver the Energy Smart Grocery Program (a BPA-administered program, with incentives funded by City Light)
  - Begin a New Lighting Program with trade allies
  - Begin a “Whole Building” approach to New Commercial Construction
  - Begin planning for a “server farm” subset program of Energy Smart Services

## ***Community Conservation Section - Residential and Small Commercial***

### **Programs**

- Continue field programs – Built Smart, Multifamily Retrofit, Smart Business, Low Income
- Continue the Neighborhood Power Program
- Continue the Twist & Save, WashWise, Refrigerator Recycling and Low-flow Showerhead programs
- Implement a pilot program for In Home Energy Monitoring
- Implement a pilot program for Home Energy Use Support

## ***Planning and Evaluation***

### **Staffing**

- Utilize temporary staffing to begin Conservation Potential Assessment project and support initial planning for new programs to be launched in 2009
- Create and fill a Planning and Evaluation Manager position

### **Projects**

- Assess Division tracking and reporting systems and develop consolidated display of savings progress
- Undertake a study of and develop an appropriate demand response program
- Continue to fund EPRI and ESource as major resources of technology, programs and markets (\$150,000)
- Finalize comprehensive planning process
- Undertake impact evaluation of Energy Smart Services program (retrofit followed by new construction)
- Prioritize program evaluations, develop three year evaluation plan, and undertake additional evaluations

## ***Monitoring and Verification***

### **Projects**

- Conduct monitoring and verification (M&V) review and recommend plan and scope of work for M&V contractor
- Develop dotted-line controls to Finance
- Issue an RFP and choose an outside/independent M&V consultant

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## ***Marketing***

### Staffing

- Reclassify and fill a Marketing Manager position

### Projects

- Prepare and implement Division marketing plan
- Establish protocol and shared calendar for event tracking, planning and participation

## ***Customer Renewables***

### Staffing

- Use intern resources to implement Solar American Cities Grant and support development of Customer Renewables strategy

### Programs

- Continue Green Up program
- Continue Washington State renewable tax incentive program
- Develop and implement commercial Green Up program

## ***Lighting Design Lab***

### Programs

- Obtain a funding commitment for 2009/2010
- Obtain new lease and relocate Lighting Design Lab

## ***Northwest Energy Efficiency Alliance***

- Continue funding at approximately \$650,000 per year

## **6.3 2009 Action Items**

Assuming budget authorization, the actions that follow will be taken by CRD in 2009. As with 2008, this list is divided by functions of the division and where appropriate organized by additional major categories including Staffing, Programs, and Projects.

## ***Commercial and Industrial Section***

### Staffing

- Create and fill a new Program Manager for the New Lighting Program
- Create and fill a new Business Solutions Account Manager for the Whole Building New Commercial Program
- Create and fill a new Business Solutions Account Manager for Commissioning and Retro-Commissioning programs
- Create and fill a new Program Manager for "Server Farm" subset program of Energy Smart Services
- Create and fill a new Program Manager for the Public Sector Lending Program
- Create and fill a new Program Manager for the Private Sector Lending Program

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## Programs

- Continue the Commercial and Industrial Section's Energy Smart Services Retrofit and New Construction Program
- Continue the Energy Smart Grocery Program (a BPA-administered program, with incentives funded by City Light)
- Continue the New Lighting Program with trade allies
- Continue the "Whole Building" approach to New Commercial Construction
- Begin a new "server farm" subset program of Energy Smart Services
- Begin a new Resource Conservation Manager program
- Begin a new Public Sector lending program
- Explore options for new Private Sector lending program

## ***Community Conservation Section - Residential and Small Commercial***

### Staffing

- Create and fill a Mixed Use New Construction Program Manager position
- Create and fill a Retail Big Box Program Manager position

### Programs

- Continue field programs – Built Smart, Multifamily Retrofit, Smart Business, Low Income
- Continue the Neighborhood Power Program
- Continue the Twist & Save, WashWise, Refrigerator Recycling and Low-flow Showerhead programs
- Offer a Mixed Use New Construction Program
- Offer a Retail Big Box Program
- Decide whether to offer a program for In Home Energy Monitoring
- Decide whether to offer a program for Home Energy Use Support

## ***Planning and Evaluation***

### Staffing

- Create and fill a Planning Evaluation Supervisor position
- Create and fill a Demand Response Analyst position
- Create and fill three Planning Analyst positions
- Create and fill one Evaluation Analyst position
- Create and fill an Emerging Technology Analyst position

### Projects

- Upgrade Division tracking and reporting systems and develop consolidated display of savings progress
- Undertake an information management study
- Undertake a comprehensive market intelligence study (\$250,000)
- Undertake a comprehensive technology study (\$125,000)
- Continue to study and develop an appropriate demand response program

- 
- Continue to fund EPRI and ESource as major resources of technology, programs and markets (\$150,000)
  - Implement additional priority evaluations

---

## ***Monitoring and Verification***

### Staffing

- Create and fill the M&V Contract Manager position

### Projects

- Continue dotted-line controls to Finance
- Continue outside/independent M&V consultant (\$1,000,000/year)

## ***Marketing***

### Staffing

- Create and fill a Marketing Analyst position
- Create and fill a Marketing Web Support position

### Projects

- Prepare and implement Division marketing plan

## ***Customer Renewables***

### Staffing

- Create and fill a Commercial Green Up Specialist position
- Create and fill a Program Manager position for On-Site Renewable Power and Cogen program
- Create and fill one Program Manager position for Small Scale Renewable and Home Power programs

### Programs

- Continue Green Up program including commercial focus
- Continue Washington State renewable tax incentive program
- Offer On-Site Renewable Power and Cogen program
- Offer Small Scale Renewable program
- Offer Home Power program

## ***Lighting Design Lab***

### Staffing

- Hire two additional Lighting Lab Specialists/Trainers

### Programs

- Finalize funding commitment for 2009/2010 and sign contracts
- Relocate or renew lease on the Lighting Design Lab

## ***Northwest Energy Efficiency Alliance***

- Continue funding at approximately \$650,000 per year

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## 6.4 2010 Action Items

Assuming budget authorization, the actions that follow will be taken by CRD in 2010. As with 2008 and 2009, this list is divided by functions of the division and where appropriate organized by additional major categories including Staffing, Programs, and Projects.

### ***Commercial and Industrial Section***

#### Programs

- Continue the Commercial and Industrial Section's Energy Smart Services Retrofit and New Construction Program
- Continue the Energy Smart Grocery Program (a BPA-administered program, with incentives funded by City Light)
- Continue the New Lighting Program with trade allies
- Continue the "Whole Building" approach to New Commercial Construction
- Continue the "server farm" subset program of Energy Smart Services
- Continue the Retro-Commissioning/Commissioning & Resource Conservation Manager program

### ***Community Conservation Section - Residential and Small Commercial***

#### Staffing

- Create and fill a Smart Business program supervisor position

#### Programs

- Continue field programs – Built Smart, Multifamily Retrofit, Low Income
- Expand Smart Business program
- Continue the Neighborhood Power Program
- Continue the Twist & Save, WashWise, Refrigerator Recycling and Low-flow Showerhead programs
- Continue the Mixed Use New Construction Program
- Continue the Retail Big Box Program
- If implemented in 2009, offer a program for In Home Energy Monitoring and/or for Home Energy Use Support

### ***Planning and Evaluation***

#### Staffing

- Create and fill one Planning Analyst position
- Create and fill one Evaluation Analyst position
- Create and fill Pilot Program Manager position

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## Projects

- Implement comprehensive tracking and reporting system (\$1,500,000)
- Continue to fund EPRI and ESource as major resources of technology, programs and markets (\$150,000)
- Implement additional priority evaluations

## ***Monitoring and Verification***

### Projects

- Continue dotted-line controls to Finance
- Continue outside/independent M&V consultant (\$1,000,000/year)

## ***Marketing***

### Projects

- Prepare and implement Division marketing plan

## ***Customer Renewables***

### Programs

- Continue Green Up program including commercial focus
- Continue Washington State renewable tax incentive program
- Offer On-Site Renewable Power and Cogen program
- Offer Small Scale Renewable program
- Offer Home Power program

## ***Lighting Design Lab***

### Staffing

- Hire one additional Lighting Lab Specialists/Trainer

### Programs

- Implement services per funding commitment

## ***Northwest Energy Efficiency Alliance***

- Continue funding at a projected level of \$815,000 per year

## ***Appendix A: Detailed Sector/Program Summary Tables***

The following tables present the economic analysis results, cumulative energy savings, and proposed budget by sector and individual energy conservation programs grouped by sector. For greater detail on annual budgets and energy savings goals for individual programs please see Appendix F of the Technical Appendix, and Appendix G includes data sheets for each program included in the Action Plan.



Expected Results - Program Sectors			Levelized \$/kWh							
Number	Name	TRC B/C Ratio	TRC	Utility Program	Measure Life	First Year \$/kWh	First Year MWhs saved	% of total savings	5-Year Budget	% of 5-Year Budget
100s	Commercial Programs	1.35	\$0.056	\$0.022	13.8	\$0.261	298,199	52.0%	\$77,866,693	41.8%
200s	Industrial Programs	1.61	\$0.046	\$0.025	15.0	\$0.265	56,514	9.8%	\$14,986,334	8.1%
300s & 400s	Residential & Mixed Use Programs	2.77	\$0.027	\$0.020	11.1	\$0.175	219,093	38.2%	\$38,334,082	20.6%
500s	Renewable Programs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	\$5,609,265	3.0%
600s	Other Programs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	\$13,281,854	7.1%
700s	Infrastructure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	\$36,016,932	19.4%
	<b>Total</b>	<b>1.34</b>	<b>\$0.056</b>	<b>\$0.032</b>	<b>11.1</b>	<b>\$0.324</b>	<b>573,807</b>	<b>100.0%</b>	<b>\$186,095,159</b>	<b>100.0%</b>

Expected Results - Commercial Programs			Levelized \$/kWh								
Number	Name	TRC B/C Ratio	TRC	Utility Program	Measure Life	First Year \$/kWh	First Year MWhs saved	% of commercial sector savings	5-Year Budget	% of 5-Year Budget	Confidence
101	Energy Smart Services - Commercial Retrofit	1.15	\$0.067	\$0.023	15.0	\$0.252	92,189	30.9%	\$23,192,339	29.8%	H
102	New Commercial - Whole Building	2.60	\$0.029	\$0.020	15.0	\$0.238	15,109	5.1%	\$3,595,403	4.6%	M
103	Energy Smart Services - New Construction	1.83	\$0.041	\$0.031	15.0	\$0.308	22,232	7.5%	\$6,852,588	8.8%	M
104	Grocery Store Initiative	3.06	\$0.023	\$0.012	8.0	\$0.090	6,325	2.1%	\$567,992	0.7%	M
105	Smart Business	1.26	\$0.058	\$0.043	11.0	\$0.334	16,920	5.7%	\$5,652,733	7.3%	H
106	Lighting Trade Ally Program	1.43	\$0.054	\$0.017	15.0	\$0.226	135,825	45.5%	\$30,680,847	39.4%	M
107	Retro-Commissioning/ Commissioning	0.97	\$0.071	\$0.042	7.0	\$0.223	9,600	3.2%	\$2,143,932	2.8%	L
108	Energy Efficient Data Centers	N/A	N/A	N/A	N/A	N/A	0	0.0%	\$361,111	0.4%	L
109	Financing Options	N/A	N/A	N/A	N/A	N/A	0	0.0%	\$361,111	0.5%	M
110	Energy Efficiency Fund (Public Sector Loans)	N/A	N/A	N/A	N/A	N/A	0	0.0%	\$4,458,637	5.7%	M
	<b>Total</b>	<b>1.35</b>	<b>\$0.056</b>	<b>\$0.022</b>	<b>13.8</b>	<b>\$0.261</b>	<b>298,199</b>	<b>100.0%</b>	<b>\$84,721,493</b>	<b>100.0%</b>	

Expected Results - Industrial Programs			Levelized \$/kWh								
Number	Name	TRC B/C Ratio	TRC	Utility Program	Measure Life	First Year \$/kWh	First Year MWhs saved	% of industrial sector savings	5-Year Budget	% of 5-Year Budget	Confidence
201	Energy Smart Services - Industrial	1.60	\$0.046	\$0.025	15.0	\$0.265	55,714	98.6%	\$14,780,874	98.7%	H
202	Simple Compressor Rebates	2.07	\$0.036	\$0.019	15.0	\$0.257	800	1.4%	\$205,460	1.3%	M
	<b>Total</b>	<b>1.61</b>	<b>\$0.046</b>	<b>\$0.025</b>	<b>15.0</b>	<b>\$0.265</b>	<b>56,514</b>	<b>100.0%</b>	<b>\$14,986,334</b>	<b>100.0%</b>	

Expected Results - Residential Programs			Levelized \$/kWh								
Number	Name	TRC B/C Ratio	TRC	Utility Program	Measure Life	First Year \$/kWh	First Year MWhs saved	% of residential sector savings	5-Year Budget	% of 5-Year Budget	Confidence
302	Multifamily New Construction - Built Smart	2.65	\$0.031	\$0.031	25.0	\$0.420	12,610	5.8%	\$5,292,728	14.1%	M
303	Common Area Lighting	1.75	\$0.042	\$0.034	16.0	\$0.326	3,000	1.4%	\$977,043	2.6%	M
304	Multifamily Weatherization	1.08	\$0.083	\$0.028	30.0	\$0.510	5,551	2.5%	\$2,832,573	7.5%	M
305	CFL Retail Program - Twist and Save	5.82	\$0.012	\$0.008	9.0	\$0.072	164,050	75.4%	\$11,833,729	31.5%	H
306	Wash Wise	1.15	\$0.065	\$0.017	14.0	\$0.197	5,106	2.3%	\$1,006,979	2.7%	M
307	Refrigerator Recycling	2.23	\$0.030	\$0.030	6.0	\$0.171	11,609	5.3%	\$1,981,296	5.3%	H
308	Residential Lighting	5.01	\$0.014	\$0.014	9.0	\$0.112	9,583	4.4%	\$1,071,576	2.8%	H
309	Neighborhood Power Project	N/A	N/A	N/A	N/A	N/A	0	0.0%	\$590,941	1.6%	N/A
310	Low Income - Single and Multifamily	0.78	\$0.116	\$0.116	25.0	\$2.379	4,585	2.1%	\$10,908,194	29.0%	M
311	Retail Big Box	1.16	\$0.064	\$0.049	15.0	\$0.411	1,600	0.7%	\$657,857	1.7%	L
312	In Home Monitors	N/A	N/A	N/A	N/A	N/A	0	0.0%	TBD	0.2%	L
313	Home Audits/ Home Use Support	N/A	N/A	N/A	N/A	N/A	0	0.0%	TBD	1.1%	L
314	LEED For New Homes	N/A	N/A	N/A	N/A	N/A	0	0.0%	TBD	0.0%	L
	<b>Total</b>	<b>2.77</b>	<b>\$0.027</b>	<b>\$0.020</b>	<b>11.1</b>	<b>\$0.173</b>	<b>217,694</b>	<b>100.0%</b>	<b>\$37,622,917</b>	<b>100.0%</b>	

Expected Results - Mixed Use Programs			Levelized \$/kWh								
Number	Name	TRC B/C Ratio	TRC	Utility Program	Measure Life	First Year \$/kWh	First Year MWhs saved	% of mixed use sector savings	5-Year Budget	% of 5-Year Budget	Confidence
401	Mixed Use New Construction	1.56	\$0.053	\$0.049	24.5	\$0.508	1,399	100.0%	\$711,165	100.0%	M
	<b>Total</b>	<b>1.56</b>	<b>\$0.053</b>	<b>\$0.049</b>	<b>24.5</b>	<b>\$0.508</b>	<b>1,399</b>	<b>100.0%</b>	<b>\$711,165</b>	<b>100.0%</b>	

## ***Appendix B: Staffing Plan and New Positions***

The following tables provide additional detail regarding the proposed timing of new positions and the specific program or functional assignments of each new position. The figure that follows shows the proposed organizational structure for the plan with the numbers and type (existing or new) of positions associated with each function or program.

**Table B-1: New Position Detail**

		Program #	2009				2010	2011	Total
			Q1	Q2	Q3	Q4			
<b>Rebuild Core Competencies</b>									
	Community Conservation Manager	701	1.0					1.0	
	M&V Contract Mgr	708	1.0					1.0	
	Planning Analysts	703	1.0	1.0	1.0			3.0	
	Economist	703	1.0					1.0	
	Marketing Analyst	706	1.0					1.0	
	Web Support	706		1.0				1.0	
	Demand Response Analyst	601			1.0			1.0	
	Commercial Greenup Analyst	502				1.0		1.0	
	Subtotal		5.0	2.0	2.0	1.0	0.0	10.0	
<b>Expand Existing Programs</b>									
	Commercial Lighting Program	106	1.0					1.0	
	Data Centers	108		1.0				1.0	
	HVAC & Retrocommissioning	107			1.0			1.0	
	Residential Contract Mgr	311		1.0				1.0	
	Evaluation Analysts	703			1.0	1.0		2.0	
	Subtotal		1.0	2.0	2.0	0.0	1.0	6.0	
<b>Develop &amp; Implement New Programs</b>									
	Resource Conservation Manager	107		1.0				1.0	
	Financing Programs	Split 109/110	1.0					1.0	
	Mixed Use	401		1.0				1.0	
	Smart Biz Supervisor	105				1.0		1.0	
	Evaluation Supervisor	703	1.0					1.0	
	Emerging Tech Analyst	703				1.0		1.0	
	Pilot Program Mgr	703					1.0	1.0	
	Planning Analyst	703					1.0	1.0	
	Home Power/Solar Program	Split 504/506			1.0			1.0	
	Lighting Lab Trainer/Analysts	603		1.0			1.0	2.0	
	On-Site Power	503	1.0					1.0	
	Subtotal		3.0	3.0	1.0	1.0	4.0	12.0	
<b>Total New Positions</b>			9.0	7.0	5.0	2.0	5.0	28.0	
<b>Total New Positions by Year</b>			23.0				5.0	0.0	28.0

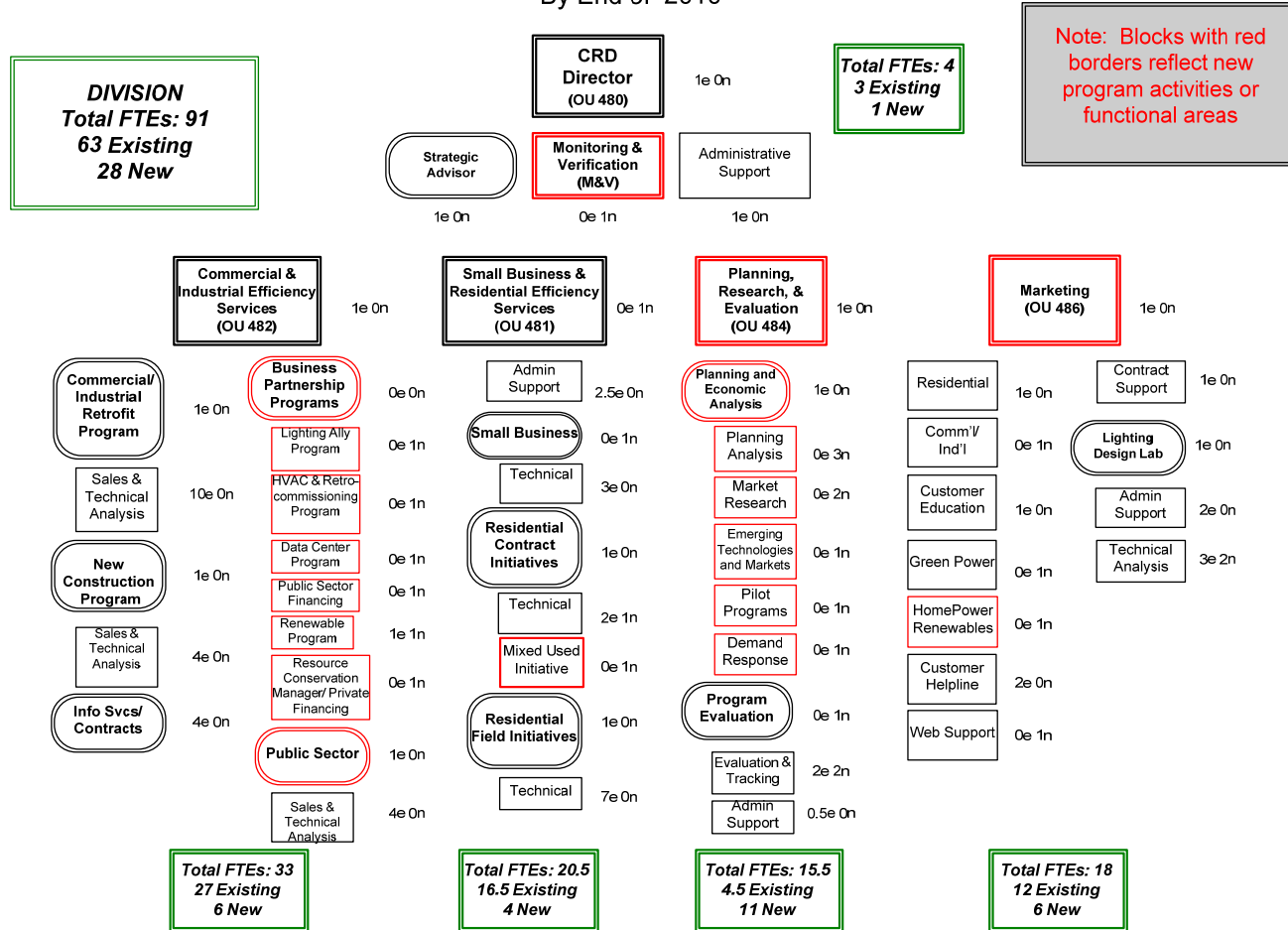
**Table B-2: New Positions by Sector or Function**

Number	Name	Existing Positions in 2008	New Positions			FTEs	Total FTEs
			2009	2010	2011	Added	in 2012
100s	Commercial Programs	17.0	5.0	1.0	0.0	6.0	23.0
200s	Industrial Programs	7.0	0.0	0.0	0.0	0.0	7.0
300s	Residential Programs	9.0	1.0	0.0	0.0	1.0	10.0
400s	Mixed Use Programs	0.0	1.0	0.0	0.0	1.0	1.0
500s	Renewable Programs	1.0	3.0	0.0	0.0	3.0	4.0
600s	Other Programs	6.0	2.0	1.0	0.0	3.0	9.0
701	Infrastructure: Management	8.0	1.0	0.0	0.0	1.0	9.0
702	Infrastructure: Support	10.0	0.0	0.0	0.0	0.0	10.0
703	Infrastructure: Planning & Evaluation	3.0	7.0	3.0	0.0	10.0	13.0
706	Infrastructure: Marketing	2.0	2.0	0.0	0.0	2.0	4.0
708	Infrastructure: M&V	0.0	1.0	0.0	0.0	0.0	1.0
	Total FTEs Added	x	23.0	5.0	0.0	28.0	X
	<b>Total FTEs</b>	<b>63.0</b>	<b>86.0</b>	<b>91.0</b>	<b>91.0</b>	<b>x</b>	<b>91.0</b>

Figure B-1: Proposed Organizational Structure

## Conservation Resources Division Organizational Structure

By End of 2010



## ***Appendix C: Business Case and Budget Issue Papers***

The following business case summarizes the rationale for and economic analysis of the National Leadership path recommended in the Conservation Resource Division's (CRD) 5-Year Action Plan. This document is intended to serve as a high-level summary of the plan's budget and staffing requirements and economic analysis.

### **Project Description**

The 5-Year Conservation Action Plan aggressively accelerates Seattle City Light's energy conservation acquisition goals through existing and new programs, restores capability in conservation infrastructure such as marketing, planning and evaluation, and expands support of customer-installed renewables and demand response/management. Energy savings goals under the proposed Five Year Plan more than double from 2007 levels of 7.25 aMW to 15.3 aMW in 2012.

<b>Five Year Plan</b>			
<b>Year</b>	<b>aMW<sup>1</sup></b>	<b>MW<sup>2</sup></b>	<b>\$ Million<sup>3</sup></b>
2007	7.25	63,510	\$20.19
2008	8.4	73,804	\$25.03
2009	12.2	180,521	\$41.94
2010	14.5	307,070	\$46.13
2011	15.1	439,561	\$50.17
2012	15.3	573,807	\$51.33
<b>2008-2012 TOTAL</b>	<b>65.5</b>	<b>573,807</b>	<b>\$214.60</b>

***Alignment with  
key local,  
regional, and  
international  
initiatives***

Staffing increases from 63 FTEs at the beginning of 2008 to 91 FTEs by 2012, with 23 FTEs to be added during 2009 and 5 in 2010 for a total of 28 new FTEs. The 2008 budget of \$20.76 million increases to \$45.36 million in 2012, including \$35.81 million in 2009, \$40.18 million in 2010, and \$43.99 million in 2011. Net SCL Costs are reflected in the table above and include offsetting revenue, loan repayments, and labor loadings and Administrative & General Expenses. The following tables summarize the Plan's proposed budget and staffing levels.

<sup>1</sup> 1 average MW (aMW) = 8760 megawatt-hours (MW<sup>2</sup>). The aMW unit is a unique measure often used in the hydroelectric-based Northwest. These numbers represent the total new aMW of conservation achieved in each year.

<sup>2</sup> Starting in 2008, MWh savings are cumulative. For example, 2008 represents savings from only 2008, 2009 represents savings from 2008 and 2009, 2010 represents savings from '08, '09 and '10, etc.

<sup>3</sup> These figures represent Seattle City Light's Net Costs for the Five-Year Plan. These figures include all program related costs, employee salaries, labor loadings, administrative and general expenses, offsetting revenue from outside parties, and loan repayments. Full costs are broken down in Appendix F.



Budget Projections								
Number	Name	2008	2009	2010	2011	2012	5-Yr Total	% of 5-Yr Total
100s	Commercial Programs	\$7,158,488	\$15,549,635	\$15,957,133	\$19,119,681	\$20,081,755	\$77,866,693	41.8%
200s	Industrial Programs	\$1,716,876	\$2,397,645	\$3,147,081	\$3,769,073	\$3,955,658	\$14,986,334	8.1%
300s	Residential Programs	\$6,402,269	\$7,560,051	\$7,503,168	\$8,051,819	\$8,105,611	\$37,622,917	20.2%
400s	Mixed Use Programs	\$0	\$141,526	\$168,933	\$197,868	\$202,839	\$711,165	0.4%
500s	Renewable Programs	\$320,823	\$907,645	\$1,272,557	\$1,344,881	\$1,763,359	\$5,609,265	3.0%
600s	Other Programs	\$1,955,848	\$2,485,728	\$2,839,761	\$2,963,654	\$3,036,863	\$13,281,854	7.1%
701	Infrastructure: Management	\$768,767	\$893,765	\$917,005	\$958,237	\$983,151	\$4,520,924	2.4%
702	Infrastructure: Support	\$501,683	\$519,242	\$532,744	\$546,595	\$560,807	\$2,661,071	1.4%
703	Infrastructure: Planning & Evaluation	\$1,227,743	\$2,070,742	\$3,236,489	\$3,395,755	\$3,480,151	\$13,410,880	7.2%
704	Infrastructure: Information Management	\$0	\$512,000	\$1,575,000	\$524,442	\$0	\$2,611,442	1.4%
705	Infrastructure: Intern Program	\$0	\$200,000	\$210,000	\$215,103	\$220,330	\$845,433	0.5%
706	Infrastructure: Marketing	\$324,904	\$690,792	\$849,613	\$878,074	\$899,929	\$3,643,313	2.0%
707	Infrastructure: Miscellaneous	\$380,000	\$790,428	\$883,586	\$905,057	\$927,050	\$3,886,121	2.1%
708	Infrastructure: M&V	\$0	\$1,087,589	\$1,089,866	\$1,116,503	\$1,143,790	\$4,437,748	2.4%
	<b>Total</b>	<b>\$20,757,402</b>	<b>\$35,806,787</b>	<b>\$40,182,936</b>	<b>\$43,986,740</b>	<b>\$45,361,294</b>	<b>\$186,095,159</b>	<b>100.0%</b>

These figures represent the direct budget requirements of the Conservation Resources Division. They do not include \$10.2 million in expected offsetting revenues, \$1.4 million in loan repayments, and \$40.1 million in labor loadings and Administrative and General Expenses. Those amounts are included in the economic analysis summarized below.

Number	Name	Existing Positions in 2008	New Positions					FTEs Added	Total FTEs in 2012
			2009	2010	2011	2012			
100s	Commercial Programs	17.0	5.0	1.0	0.0	0.0	6.0	23.0	
200s	Industrial Programs	7.0	0.0	0.0	0.0	0.0	0.0	7.0	
300s	Residential Programs	9.0	1.0	0.0	0.0	0.0	1.0	10.0	
400s	Mixed Use Programs	0.0	1.0	0.0	0.0	0.0	1.0	1.0	
500s	Renewable Programs	1.0	3.0	0.0	0.0	0.0	3.0	4.0	
600s	Other Programs	6.0	2.0	1.0	0.0	0.0	3.0	9.0	
701	Infrastructure: Management	8.0	1.0	0.0	0.0	0.0	1.0	9.0	
702	Infrastructure: Support	10.0	0.0	0.0	0.0	0.0	0.0	10.0	
703	Infrastructure: Planning & Evaluation	3.0	7.0	3.0	0.0	0.0	10.0	13.0	
706	Infrastructure: Marketing	2.0	2.0	0.0	0.0	0.0	2.0	4.0	
708	Infrastructure: M&V	0.0	1.0	0.0	0.0	0.0	1.0	1.0	
	<b>Total FTEs Added</b>	<b>x</b>	<b>23.0</b>	<b>5.0</b>	<b>0.0</b>	<b>0.0</b>	<b>28.0</b>	<b>x</b>	
	<b>Total FTEs</b>	<b>63.0</b>	<b>86.0</b>	<b>91.0</b>	<b>91.0</b>	<b>91.0</b>	<b>x</b>	<b>91.0</b>	

### Rationale

The aggressive energy savings goals of the National Leadership Path provide a cost-effective energy resource consistent with the 2006 Integrated Resource Plan's cost-effectiveness threshold of \$0.06 per kWh. The energy savings are at levels consistent with the 2006 Conservation Potential Assessment and are slightly higher than the accelerated path being considered in the 2008 Integrated Resource Planning Process. These energy savings will provide significant benefits to participating customers in the form of reduced electricity bills, with customers gaining estimated net benefits of \$169 million dollars during the life of the proposed conservation measures. In addition, the energy savings will also provide significant environmental benefits as a result of reduced production from fossil-fueled power plants, including reduction of greenhouse gas emissions estimated at more than 990,000 metric tons of carbon dioxide during the years from 2008 to 2012.<sup>4</sup>

<sup>4</sup> This calculation uses Seattle City Light's current estimate of the carbon dioxide emissions from system-wide marginal power plant operations of 0.6 metric tons per MWh.

Reinvestment in and restoration of core functions such as marketing, planning, and evaluation will ensure the long-term viability of SCL's "conservation power plant". Development of new conservation programs will increase SCL's ability to meet the proposed aggressive energy savings goals and increase customer satisfaction. Dedicated staffing for customer renewables, demand response and new technology will increase the utility's capabilities in these areas and its ability to inform utility planning efforts and respond to strategic opportunities and customer needs.

### **Economic Analysis**

The economics of the Plan were assessed using the Portfolio Pro model licensed from Quantec, LLC. The energy savings and cost assumptions used in the analysis came from one or more of the following sources: past evaluations of existing programs, other credible utility or regional sources, recent program experience and/or professional judgment. The financial assumptions used in the modeling were endorsed by SCL's Financial Planning Unit. Appendix D includes a more detailed explanation of the economic framework and financial assumptions used in this analysis. Likewise, the Technical Appendix documents the key cost and savings assumptions used for each of the programs.

The National Leadership Path was shown to provide cost effective energy savings from a number of economic perspectives.<sup>5</sup> The primary perspective of interest is the Total Resource Cost (or Service Territory) perspective, which takes into consideration the benefits and costs of the entire service territory, including customers. Under this perspective, the benefit/cost ratio is 1.34 with an associated Net Present Value of \$120.7 million. The levelized cost to the Service Territory is \$0.056 per kWh, which is below the \$0.06 per kWh threshold established in the 2006 IRP. Alternatively, the levelized cost to the utility (from the program perspective) of the energy savings is \$0.032 per kWh. The following table from Portfolio Pro summarizes the portfolio's economics from the five different perspectives typically used in assessing the economics of conservation.

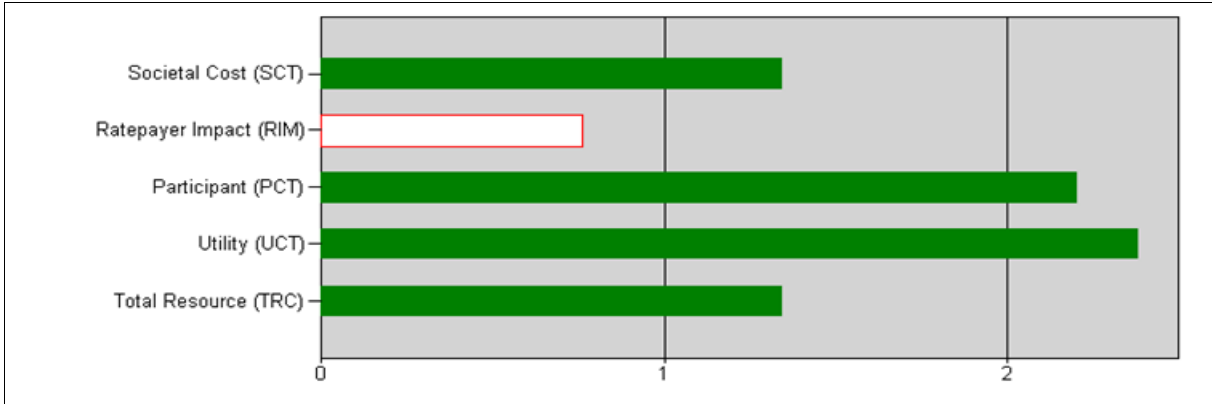
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<sup>5</sup> The Total Resource Cost (aka Service Territory) perspective reflects a policy priority on reducing the overall cost of providing energy services to the community, and as such is the primary cost-effectiveness test applied. The benefit/cost (B/C) ratio should be greater than 1.0 unless a program is justified on some other basis such as low-income. This perspective values the energy savings based on the avoided cost of power that would otherwise have to be acquired. The costs include the total cost of installing the conservation, including the customer's share and the utility's cost to run the program(s), both financial incentives and administration. The Utility Program perspective includes the same benefits but ignores the customer's share of the conservation measure. The Participant perspective includes only the participating customer's cost to install the conservation and their electricity bill savings. The Ratepayer (aka Utility Financial) Perspective, like the Utility Program perspective, does not include the customer's share of the conservation measure, but it also accounts for the customer bill savings as a cost to the utility (lost retail revenues). Since the customer is not included in this perspective, their bill savings benefits are ignored. The Ratepayer perspective reflects a policy priority on keeping rates as low as possible; it reflects the impact on non-participants but is generally not used for decision-making, and a B/C ratio less than 1.0 is not unusual.

Name	Type	Start Year	End Year	Average Electric Retail Rate	Average Measure Life
<b>5 Year Plan - Full Portfolio</b>	portfolio	2008	2012	0.06	11.14

**Benefit/Cost Ratios**

	Benefits (NPV)	Costs (NPV)	Net Benefits	B/C Ratio	Cost of Conserved
Total Resource (TRC)	\$472,186,058	\$351,474,248	\$120,711,809	1.34	\$.056
Utility (UCT)	\$472,186,058	\$198,084,635	\$274,101,423	2.38	\$.032
Participant (PCT)	\$309,894,508	\$140,597,956	\$169,296,553	2.20	\$.03
Ratepayer Impact (RIM)	\$472,186,058	\$622,003,656	-\$149,817,598	0.76	\$.099
Societal Cost (SCT)	\$472,417,444	\$351,474,248	\$120,943,195	1.34	\$.056



The following table provides an alternative presentation of these economic results.

<b>Utility Program Perspective</b>		Dollars in Millions
Avoided Power (Benefit to Utility)		\$472.2
Program Costs (Costs to Utility)		(\$198.1)
Net Benefit to Utility		<b>\$274.1</b>
Utility Benefit/Cost Ratio		<b>2.38</b>
<b>Participating Customer Perspective</b>		
Customer Bill Savings (Benefit to Customer)		\$309.9
Customer Conservation Cost (Cost to Customer)		(\$140.6)
Net Benefits to Customer		<b>\$169.3</b>
Customer Benefit/Cost Ratio		<b>2.20</b>
<b>Service Territory Perspective (Total Resource Cost)</b>		
Avoided Power (Benefit to Service Territory)		\$472.2
Total Costs (Utility + Customer Conservation)		(\$351.5)
Net Benefit to Service Territory		<b>\$120.7</b>
Service Territory Benefit/Cost Ratio		<b>1.34</b>

**30 Year Analysis -- 2008\$ (NPV)**

**Alternatives**

The 5 Year Plan focuses on the budget, staffing and systems necessary to deliver the "National Leadership" path. For purposes of sensitivity analysis two alternative scenarios were developed and analyzed. The first aims to address the question of how the economics of the recommended plan are affected if budget and staff are approved but the energy savings goals are not met because of lower than planned customer participation. The second analyzes a less aggressive path which captures the available cost-effective energy savings potential less rapidly.

**Case #1: "Lack of customer participation"**. In this case, the recommended resources of budget, staffing and systems are approved and are implemented as scheduled, but customer participation only provides 80% of the planned energy savings. All labor, marketing and administration costs are equal to the base plan, but energy savings and associated incentive payments are only 80% of the National Leadership Path. Also under this case, customer financial incentives per unit of energy savings are assumed to increase by an additional 10% in 2011 and 2012 (above the 10% increase in those years assumed for the base case National Leadership Path) in an attempt to generate additional customer participation.

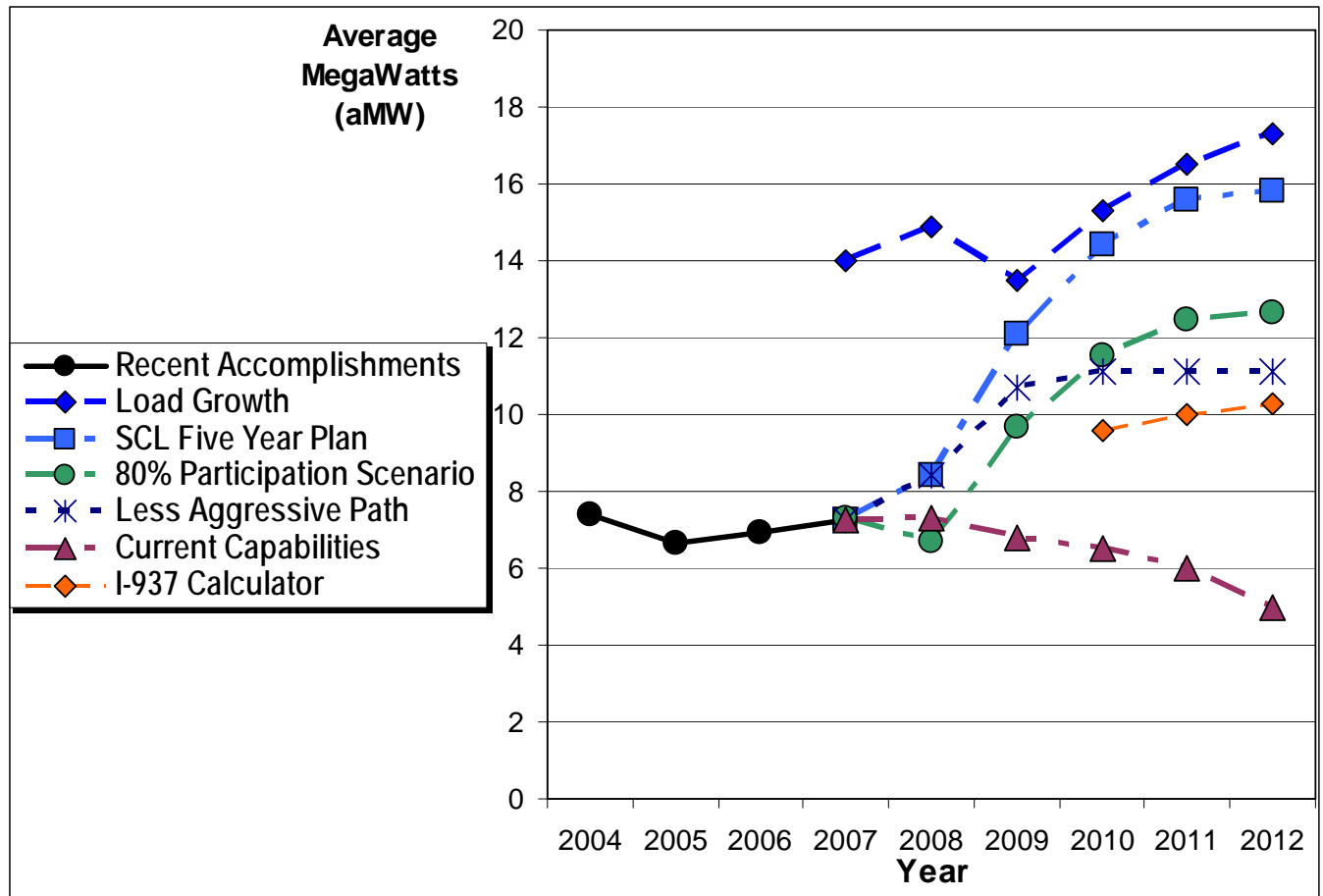
The results of this case are presented in the table below. As expected, the net benefits and benefit/cost ratio for each perspective are lower than those for the National Leadership Path, since the fixed costs of conservation programs are still fully committed and the benefits are lower. Additional extrapolation of these results show that energy savings could be as low as 50% of planned levels until the total costs borne by customers and the utility exceeded the benefits.

<b>Utility Program Perspective</b>	Dollars in Millions	<b>Nat'l Leadership</b>
Avoided Power (Benefit to Utility)	\$398.4	
Program Costs (Costs to Utility)	(\$180.7)	
Net Benefit to Utility	<b>\$217.7</b>	<b>\$274.1</b>
Utility Benefit/Cost Ratio	<b>2.21</b>	<b>2.38</b>
<b>Participating Customer Perspective</b>		
Customer Bill Savings (Benefit to Customer)	\$260.8	
Customer Conservation Cost (Cost to Customer)	(\$110.2)	
Net Benefits to Customer	<b>\$150.6</b>	<b>\$169.3</b>
Customer Benefit/Cost Ratio	<b>2.37</b>	<b>2.20</b>
<b>Service Territory Perspective (Total Resource Cost)</b>		
Avoided Power (Benefit to Service Territory)	\$398.4	
Total Costs (Utility + Customer Conservation)	(\$300.8)	
Net Benefit to Service Territory	<b>\$97.6</b>	<b>\$120.7</b>
Service Territory Benefit/Cost Ratio	<b>1.32</b>	<b>1.34</b>

**Case #2: "Reduced Budget and Staff".** Under this case, the budget increase approved is only 50% of the National Leadership Path, staffing increases are limited to the ten new positions required to "rebuild core competencies", and energy savings goals are reduced accordingly, reaching just over 11 aMW in 2011 and 2012. Customer incentives, staffing costs are reduced accordingly. The results, presented in the following table, show 10% lower utility net benefits due to the slower pace of acquiring cost-effective energy savings, as well as lower customer net benefits.

<b>Utility Program Perspective</b>	Dollars in Millions	<b>Nat'l Leadership</b>
Avoided Power (Benefit to Utility)	\$403.8	
Program Costs (Costs to Utility)	(\$168.4)	
Net Benefit to Utility	<b>\$235.4</b>	<b>\$274.1</b>
Utility Benefit/Cost Ratio	<b>2.40</b>	<b>2.38</b>
<b>Participating Customer Perspective</b>		
Customer Bill Savings (Benefit to Customer)	\$265.4	
Customer Conservation Cost (Cost to Customer)	(\$113.1)	
Net Benefits to Customer	<b>\$152.3</b>	<b>\$169.3</b>
Customer Benefit/Cost Ratio	<b>2.35</b>	<b>2.20</b>
<b>Service Territory Perspective (Total Resource Cost)</b>		
Avoided Power (Benefit to Service Territory)	\$403.8	
Total Costs (Utility + Customer Conservation)	(\$291.0)	
Net Benefit to Service Territory	<b>\$112.8</b>	<b>\$120.7</b>
Service Territory Benefit/Cost Ratio	<b>1.39</b>	<b>1.34</b>

The figure below summarizes the energy savings assumed for the National Leadership Path, the alternative scenarios, and compares those to recent accomplishment and forecast load growth.



**Summary**

The business case presented for the National Leadership Path shows that there is great potential to substantially increase SCL's conservation resource acquisition. Reinvestment in and restoration of core functions such as marketing, planning, and evaluation will ensure the long-term viability of SCL's "conservation power plant". Development of new conservation programs will increase SCL's ability to meet the proposed aggressive energy savings goals and increase customer satisfaction. Dedicated staffing for customer renewables, demand response and new technology will increase the utility's capabilities in these areas and its ability to inform utility planning efforts and respond to strategic opportunities and customer needs.

**Key Financial Assumptions**

The financial assumptions used in the Portfolio Analysis and endorsed by City Light's Financial Planning staff are summarized below. The avoided cost was developed by starting with the 2006 IRP average figure of \$60/MWh and then shaping that hourly based on the monthly and peak/off-peak shape of the latest wholesale power price forecast from Global Energy.

<b>Economic Assumptions</b>	
Utility/RIM Discount Rate	3.000%
Participant Discount Rate	7.000%
Societal Discount Rate	3.000%
TRC Discount Rate	3.000%
Inflation	2.430%
Electric Retail Rate Escalator	0.000%
Avoided Cost Escalator	0.000%
Line Loss	7.625%
Avoided Capacity Cost (\$/MW)	\$0.00
Measure Cost Escalator	0.000%
Labor Cost Escalator	0.000%

<b>Retail Rates</b>	<b>\$/kWh</b>
Residential	\$0.0793
Commercial	\$0.0500
Industrial	\$0.0500

<b>Labor Loadings</b>	
Paid Leave (incl. with salaries)	21.84%
Other Paid Benefits	33.94%
FICA/Med/Unemployment	8.87%
Admin & Gen Overhead	\$28.16/hr

**Budget Issue Papers**

The following Budget Issue Papers (BIPs) were submitted to obtain necessary funding for Seattle City Light's Energy Efficiency Fund program and the increase in FTEs to support the implementation of the Five-Year Plan.

## ***Appendix C1: Budget Issue Paper – CRD Five-Year Plan***

### **2009-10 Budget Issue Paper (5/21/08 DRAFT)**

<b>Department:</b>	Seattle City Light	
<b>BIP Title:</b>	Conservation 5 Year Plan	
<b>BIP Number:</b>	SCL-tbd	
<b>Budget program(s) affected:</b>	SCL 2PS_BCL2, Conservation Resources Division (CRD)	
<b>Estimated \$ change:</b>	<b>Light Fund \$</b>	<b>Light Fund \$</b>
	<b>2009</b>	<b>2010</b>
	<b>\$10.76 million</b>	<b>\$18.96 million</b>
<b>Regular positions affected:</b>	<b>No. of Positions: 22</b> (10 in '08, 12 in '09)	<b>Total FTE Change: 27</b> (10 in '08, 12 in '09, and 5 in '10)
<b>Other departments affected:</b>	DPD Green Bldg Team increased by \$80K (OH funding status quo)	
<b>Capital/Operating budget:</b>	Regular and Deferred O&M	

#### **(1) Summary of BIP (100 words or less):**

SCL proposes to significantly expand its energy conservation acquisition goals, as detailed in the Conservation Five Year Action Plan (the Plan). The 2007 goal of 7.25 average Megawatts (aMW) increases to 10.1 in 2008, 12.1 in 2009 and 14.4 in 2010. The Plan's four primary components are: 1) rebuild conservation infrastructure; 2) expand existing conservation programs; 3) develop new conservation programs; and 4) incorporate small scale renewable energy and demand response at customer sites. Capabilities in several areas will be restored or newly developed, including monitoring and verification, planning and evaluation, marketing, information management, customer renewables, and demand response.

#### **(2) Detailed explanation:**

As detailed in the Plan, SCL will expand its existing energy conservation programs, implement a variety of new programs, and expand its involvement in customer renewables and demand response. SCL will also restore its conservation infrastructure in the areas of monitoring and verification, planning and evaluation, marketing, and information management. This will ensure the credibility of energy savings claims, ensure the success and continued improvement of existing programs, and allow expansion into new program opportunities and emerging technologies.

SCL proposes incremental budget increase over 2008 levels of \$10.76 million in 2009 and \$18.96 million in 2010. All of this increase is O&M, split 26% regular O&M and 74% deferred O&M in 2009; 22% regular O&M and 78% deferred O&M in 2010. The increases from 2008 are broken out as follows:

Category	2009 Increment		2010 Increment	
	Regular O&M	Deferred O&M	Regular O&M	Deferred O&M
Labor	\$959,819	\$817,623	\$1,252,568	\$1,067,002
Customer Incentives	\$532,636	\$5,861,760	\$409,184	\$11,095,930
Other	\$1,344,252	\$1,245,646	\$2,555,975	\$2,581,175
<b>TOTAL</b>	<b>\$2,836,707</b>	<b>\$7,925,029</b>	<b>\$4,217,727</b>	<b>\$14,744,107</b>

The most significant components of the "Other" category include the following:



- New Measurement and Verification function performed by an outside contractor
- Significantly increased program evaluation activity
- Expanded marketing support
- New Information Management systems
- Expansion of the Lighting Design Lab services, including \$80K for relocation and increased rent.
- Establishment of an intern program
- Expansion of Green Up and Green Power programs offset by voluntary customer contributions, the Washington State Renewable Incentive Program offset by state utility tax funds, and establishment of additional customer renewable incentive programs.
- Additional \$80K per year for Green Building Team at DPD.

Total offsetting revenues of \$1.76 million are assumed in 2009 and \$2.12 million in 2010.

**(3) Anticipated outcome of change:**

As a result of the increased budget and staff, CRD will expand its acquisition of cost-effective energy conservation as the least-cost, least-risk and least-environmental impact energy source available to meet SCL's future energy resource needs. This will result in reduced costs to the Utility, reduced customer bills and lower greenhouse gas emissions. These factors are detailed in the Draft Business Plan included as Attachment 1 to this BIP.

With regards to Policy considerations regarding climate change, this Plan helps ensure SCL's continued greenhouse gas neutrality and it puts the utility on a path to achieve the Mayor's 20% reduction goal for energy use in residential and commercial buildings in approximately 15 years for the electricity sector.

**(4) Department workforce change (regular positions to be added, abrogated, reduced in FTE or reassigned to different programs). Include titles when known:**

The Plan calls for CRD's 2008 staffing level of 63.5 FTEs to be increased by 10 FTEs through a 2008 supplemental budget request. Building on that new 2008 baseline of 73.5 FTEs, SCL proposes to add an additional 12 FTEs in 2009 and 5 FTEs in 2010. The proposed position additions are detailed in Appendix B of the Plan and are included as Attachment 2 to this BIP.

**(5) Consequences if BIP not approved:**

If the recommended resources for the Conservation Five Year Plan are not allocated, acceleration of energy savings acquisition levels will not be possible and over time the existing level of savings will not be able to be maintained because of the recent atrophy of marketing, planning and evaluation capabilities. This will result in higher costs to the utility for power purchases, lower bill savings to customers participating in conservation programs, and fewer avoided greenhouse gas emissions.

**(6) Race and Social Justice Impacts:**

**A) How does this action accomplish the Mayor's Race and Social Justice Initiative? How did you determine the reasoning for your response?**

Under the 5 Year Conservation Action Plan, City Light will make a concerted effort to convey energy efficiency information and offer easy conservation program access to the diverse and historically underserved communities and minority-owned businesses in an effective and culturally relevant manner. Improved access to conservation information and programs by the City's diverse communities will increase energy savings, reduce these customers'

electric bills, achieve positive behavioral changes around energy efficiency, and help achieve the economic equity, public engagement, and inclusion/access to services goals of the Race and Social Justice Initiative.

In addition, City Light will carry out outreach activities to the city's youth to promote environmental stewardship. These efforts will plant the seeds for the conservation "ambassadors" that will lead the next generation and fill the increasing number of "green" jobs expected in the next several years.

**B) Please identify any unintended consequences from this proposal**

None known

## ***Appendix C2: Budget Issue Paper – Energy Efficiency Fund***

### **2009-10 Budget Issue Paper (6/26/08 DRAFT)**

<b>Department:</b>	Seattle City Light	
<b>BIP Title:</b>	Energy Efficiency Fund	
<b>BIP Number:</b>	SCL-511	
<b>Budget program(s) affected:</b>	SCL 2PS_BCL2, Conservation Resources Division (CRD)	
<b>Estimated \$ change:</b>	<b>Light Fund \$</b>	<b>Light Fund \$</b>
	<b>2009</b>	<b>2010</b>
	<b>\$4.167 million</b>	<b>\$84,744</b>
<b>Regular positions affected:</b>	<b>No. of Positions: 1</b>	<b>Total FTE Change: 1</b>
<b>Other departments affected:</b>	Those with City-owned facilities (e.g. Fleets & Facilities, Parks, SPU)	
<b>Capital/Operating budget:</b>	Regular and Deferred O&M	

#### **(1) Summary of BIP (100 words or less):**

SCL proposes to add budget in 2009 and 2010 to: 1) finance the full cost of energy efficiency investments in City facilities; 2) assess conservation potential in those facilities; and 3) fund one FTE to manage this new loan program.

#### **(2) Detailed explanation:**

As an additional increment to its proposed Five Year Conservation Plan, SCL proposes to add to its conservation budget by slightly over \$4.2 million in 2009 and around \$85,000 in 2010 to allow it to lend City Departments 100% of the initial cost of energy efficiency upgrades in City-owned facilities. City Departments will repay SCL the loan principal and its cost of borrowing (currently 5.5% for first lien debt). The repayment schedule will be shorter than the expected life of the installed conservation measures but long enough so that the City Departments' costs of electricity and loan repayment should be less than its previous costs of electricity. It is expected loan repayment terms could range from 8 to 15 years.

In addition to the loan funds, SCL is requesting \$97,526 in 2009 for consultant assistance in assessing conservation potential and opportunities in City facilities, as well as funding of one FTE to manage this new program. Note that all funding for 2010 covers the salary for fund's one FTE.

The proposed incremental budget increase (over 2008 levels and the increments proposed in the Conservation Five Year Plan) is \$4.167 million in 2009 and \$84,744 in 2010. All of this increase is O&M, with 99.7% deferred O&M and 0.3% regular O&M in 2009, and 80.0% deferred O&M and 20.0% regular O&M in 2010. The incremental request is broken out as follows:

Category	2009 Increment		2010 Increment	
	Regular O&M	Deferred O&M	Regular O&M	Deferred O&M
Loan Funds	\$0	\$4,000,000	\$0	\$0
Consultant	\$0	\$97,526	\$0	\$0
Labor	\$16,519	\$66,077	\$16,950	\$67,795
<b>TOTAL</b>	<b>\$16,519</b>	<b>\$4,163,603</b>	<b>\$16,950</b>	<b>\$67,795</b>

#### **(3) Anticipated outcome of change:**

City Light expects to acquire an additional 0.9 aMW of energy savings through this program in 2009 and 2010, assuming a total first-year cost of the energy savings of 60 cents per kWh. City Light will be fully reimbursed for its cost of the conservation investment over the term of the loan, avoiding the cost of its typical up-front conservation incentive payment. (The incentive payment typically ranges from 25% to 70% of the cost of a project, depending on the mix of conservation measures being installed.) In the short term, however, City Light's budget authority and outstanding debt will increase by the full cost of the conservation upgrades in order to provide the up-front financing of the entire cost of these projects. Deferred O&M funds, which are debt financed, will be used for this program.

As a result of this new program, City Departments implementing electricity efficiency upgrades will no longer have to provide up front capital dollars to pay for their share of the project. The reduction in electricity consumption will provide the source of the loan repayment for the length of the loan, resulting in reduced total budget requirements. It is expected that this program will replace the City's Green Building Revolving Fund established earlier in 2008.

**(4) Department workforce change (regular positions to be added, abrogated, reduced in FTE or reassigned to different programs). Include titles when known:**

SCL is proposing to add one FTE to manage this new program. The classification of the position is expected to be an Account Executive. (In order for participating City Departments to take advantage of these funds, they will have to have adequate project management staff resources to manage the energy efficiency projects.)

**(5) Consequences if BIP not approved:**

If these resources are not approved SCL will not be able to implement the new loan program for City Departments. In addition, fewer total projects are likely to be accomplished resulting in higher long-term electricity bills for the City and fewer greenhouse gas emissions being avoided.

**(6) Race and Social Justice Impacts:**

C) **How does this action accomplish the Mayor's Race and Social Justice Initiative? How did you determine the reasoning for your response?**

This proposal does not directly contribute to the accomplishment of the Mayor's Race and Social Justice Initiative.

D) **Please identify any unintended consequences from this proposal**

None known

## ***Appendix D: Economic Framework for Assessing Conservation Cost-effectiveness***

The economic framework used by Seattle City Light to assess the cost effectiveness of the portfolio of programs reflected in the 5 Year Plan has been in place since the mid-1980's. It is generally consistent with the criteria and framework developed by the California Energy Commission and Public Utility Commission for defining cost-effectiveness of energy efficiency measures and programs.

### **PERSPECTIVES**

There are several tests for evaluating energy efficiency's cost-effectiveness, each reflecting a different stakeholder perspective on the impact of energy efficiency. For the 5 Year Plan, Seattle City Light uses the following four perspectives in assessing the cost-benefits of energy efficiency programs:

**Total Resource Cost (aka Service Territory):** Measures the net direct economic impact to Seattle City Light's service territory, including participating customer costs and benefits.

**Utility (Program):** Measures the quantifiable costs & benefits that accrue to Seattle City Light's utility system and specifically excludes participant costs.

**Participant:** Measures the economic impact to the participating customer of installing energy efficiency measure under a Seattle City Light program.

**Ratepayer (aka Utility Financial):** Measures the potential rate impacts on all Seattle City Light customers especially those that do not directly participate in the conservation program.

For most utilities around the country operating energy efficiency programs, the total resource cost (TRC) test is typically used to define what is cost-effective. However, it is important to assess the impact of energy efficiency programs from all the perspectives to understand the impacts on those stakeholders and the trade offs associated with investments in energy efficiency.

### **COSTS AND BENEFITS:**

The major cost and benefit categories used in City Light's economic framework to assess the cost effectiveness of energy efficiency programs are listed below. The key questions which can be addressed for each of the perspectives are reflected in the table on the next page.

#### **Costs:**

- Direct cost of the energy efficiency measures (typically shared between the customer and utility).
- Program delivery costs
  - Labor
  - Marketing/promotion
  - Overhead and Administrative

#### **Benefits:**

- Avoided energy purchases (\$60/mwh from 2006 IRP)
  - Varies by season, month, peak vs off-peak, time of day
- Avoided transmission & distribution losses
- Customer bill savings for participants (also Cost as lost retail sales to utility)
- Avoided T&D Costs

KEY QUESTIONS ADDRESSED IN EACH PERSPECTIVE			
Perspective	Key Question	Energy Efficiency Benefits	Energy Efficiency Costs
Participant	Is the participating customer better off after the investment in the energy efficiency measures?	<ul style="list-style-type: none"> <li>• Incentives from utility (or other entity)</li> <li>• Reduced electricity bills</li> <li>• Non energy benefits (reduced water bills, reduced O&amp;M costs, increased comfort)</li> </ul>	<ul style="list-style-type: none"> <li>• Participants' out of pocket costs of program participation</li> </ul>
Ratepayer	What is the impact on utility rates with investment in the energy efficiency measure?	<ul style="list-style-type: none"> <li>• Avoided supply costs or increased wholesale power revenues</li> <li>• Reduced T&amp;D losses</li> <li>• Deferred T&amp;D investments</li> </ul>	<ul style="list-style-type: none"> <li>• Utility incentive costs</li> <li>• Utility admin costs</li> <li>• Lost utility revenues caused by reduced sales</li> </ul>
Utility	What is the impact to the utility's operations with investment in the energy efficiency measures?	<ul style="list-style-type: none"> <li>• Avoided supply costs or increased wholesale power revenues</li> <li>• Reduced T&amp;D losses</li> <li>• Deferred T&amp;D investments</li> </ul>	<ul style="list-style-type: none"> <li>• Utility incentive costs</li> <li>• Utility admin costs</li> </ul>
Total Resources Cost (TRC, aka Service Territory)	Are the benefits which flow to the community from the energy efficiency investment greater than the costs (regardless of who pays the costs and who receives the benefits)?	<ul style="list-style-type: none"> <li>• Avoided supply costs (or increased wholesale market revenues)</li> <li>• Reduced T&amp;D losses</li> <li>• Deferred T&amp;D investment</li> <li>• Non-energy benefits such as water savings, reduced O&amp;M costs, increased comfort, improved aesthetics</li> </ul>	<ul style="list-style-type: none"> <li>• Utility incentive costs</li> <li>• Utility admin costs</li> <li>• Participants' out of pocket costs</li> </ul>

# Energy Efficiency Jobs & Training Opportunities for the City of Seattle

Seattle Jobs Initiative  
May 2008



In his State of the City address in February 2008, Mayor Nickels outlined three priority items in making Seattle “America’s Green Building Capital”: improving energy efficiency in commercial and residential buildings by 20 percent, providing cost-savings for struggling homeowners through energy conservation measures, and creating new green collar jobs through investment in energy efficiency.<sup>1</sup>

This call to action has created an immediate need to understand the potential labor market demand for more green-collar jobs in the Energy Efficiency (EE) industry sector. Seattle Jobs Initiative (SJI) has been tasked with conducting research to identify the green collar jobs associated with the EE industry as well as the current local demand for these jobs and the capacity of the local workforce system to meet this demand. In addition, SJI has sought to forecast how demand for these jobs will be impacted by policies adopted by the City of Seattle to drive increased energy efficiency. The accuracy of this forecast can and should be honed further as the city defines what specific policies it will adopt and investments it will make to increase energy efficiency pursuant to the Mayor’s vision. Additional research being done by SJI (see memorandum: *A Green Energy Primer*), the Washington State Workforce Training & Education Coordinating Board and others will further clarify the workforce needs associated with the growing green economy in general and Seattle’s energy efficiency goals specifically.

The following are the key conclusions of SJI’s initial research on the EE sector:

- The vast majority of EE sector jobs are jobs that already exist. Any growth in this sector resulting from green government policies and investment and/or market forces will create few, if any, new categories of jobs, but will increase demand for categories of jobs that now exist.
- While information on newly created EE jobs is hard to determine, current occupations feeding into the EE sector in the Seattle-King County WDA exist almost exclusively in the trades and include carpenters, electricians, HVAC installers, sheet metal workers, and construction laborers, among others. It is these trades that will primarily define the middle-skill jobs required in the energy efficiency industry.
- Even without new government policies and investment effecting an increase in job demand in the sector, the select middle-skill trades occupations which dominate the EE sector are expected to add 2,300 new jobs between 2009 and 2014.
- We cannot state with confidence the extent to which local demand for EE sector jobs will be impacted by new policies or investment emanating from the City of Seattle (or the state or federal government) to drive energy efficiency without knowing what these policies and investments will be. However, we can forecast that proposed investments locally in energy efficiency will result in 7.37 job years

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<sup>1</sup> “Seattle No. 1 Green Building City in the Country” Press Release April 21, 2008

per \$1 million. The majority of these jobs will be entry-level (29%) and semi-skilled (36%) trades positions.

- The lack of a skilled workforce is the largest non-technical barrier to the advancement of renewable energy and energy efficiency technologies, according to a 2006 study by the National Renewable Energy Laboratory (NREL).<sup>2</sup>
- Evidence suggests that the local workforce system—namely the apprenticeship and pre-apprenticeship programs that serve the EE sector occupations—is already struggling to meet current demand. Heightening local demand through new policies and investment around energy efficiency will very likely exacerbate the shortage of skill workers in the sector unless training opportunities are expanded.

## Overview of the Energy Efficiency Sector

Of the many sectors created in the green economy<sup>3</sup>, Energy Efficiency (EE) is considered a major new economic and employment driver—a dynamic economic sector rich in new jobs. As part of a group of subsectors making up Clean Technology<sup>4</sup>, Energy Efficiency is getting significant attention, both in terms of investment and entrepreneurial interest<sup>5,6,7</sup>. Behind much of this attention is the fact that as a conservation effort, energy efficiency is the absolute cheapest source of new power.<sup>8</sup> In 2006, the EE industry nationwide exceeded 8 million jobs - 90% in private industry, 50% in the manufacturing sector.<sup>9</sup> Modest projections forecast an additional 7 million jobs in EE nationwide by 2030.<sup>10</sup> Within the Pacific Northwest, energy efficiency products and services are projected to bring in more than \$2 billion in annual sales through 2020.<sup>11</sup>

The EE subsector generally focuses on retrofitting existing buildings that would otherwise not have been improved upon, which may include mechanical, electrical and plumbing upgrades. Retrofitting existing buildings to be more energy efficient includes a variety of skills and jobs, mainly including “manufacturing the construction materials and devices to make buildings more efficient, as well as construction jobs and high-skill auditing jobs.”<sup>12</sup>

New sustainable strategies and materials may require new skills and new job opportunities, along with entirely new specializations, within the EE sector. Yet the

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2 R. Margolis and J. Zuboy. “Nontechnical Barriers to Solar Energy Use: Review of Recent Literature” National Renewable Energy Laboratory, 2006.

<sup>3</sup> See Memo “A Green Economy Primer”

4 Clean Technology includes the subsectors of Smart Grid, Renewable Energy, Energy Efficiency, Biomass, Recycling, and Green Design (as identified by Sustainable Business Consulting).

5 Seattle area a new hub for “clean” technology, Seattle Times 01/02/2008 Angel Gonzalez

6 Clean Technology signals next industrial revolution, enterpriseSeattle economic forecast sponsored supplement to the Puget Sound Business Journal, January 18-24, 2008. Crai S. Bower.

<sup>7</sup> POISED FOR PROFIT: How Clean Energy Can Power the Next High-Tech Job Surge in the Northwest. Climate Solutions. 2001 In Washington, Oregon, and British Columbia, clean energy is currently a \$1.4 billion a year industry, with unaided growth totaling \$2.5 billion a year over the next 20 years, producing over 12,000 jobs.

<sup>8</sup> POISED FOR PROFIT: How Clean Energy Can Power the Next High-Tech Job Surge in the Northwest. Climate Solutions. 2001.

<sup>9</sup> Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century 2007. American Solar Energy Society

<sup>10</sup> Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century 2007. American Solar Energy Society.

<sup>11</sup> POISED FOR PROFIT: How Clean Energy Can Power the Next High-Tech Job Surge in the Northwest. Climate Solutions. 2001.

<sup>12</sup> Community Jobs in the Green Economy. Apollo Alliance/Urban Habitat. 2007.



majority of jobs within the sector will be in fields that presently exist. Among these existing fields is HVAC system installation, one of the most highly skilled and labor-intensive jobs associated with retrofits.<sup>13</sup> Most currently existing occupations that constitute the EE sector qualify as green collar jobs in that they require some post-secondary training but not a 4-year degree. As is evident, many of the jobs associated with energy efficiency retrofitting look a lot like traditional construction jobs.<sup>14</sup> The following table depicts estimated job projections for selected middle-skill occupations in the EE subsector.

Energy Efficiency's growth comes with substantial employment impact potential. As the table below illustrates, of those occupations related to the building construction industry that are likely to be energy efficiency retrofit careers, firms reported as many as 550 of this skilled occupations going unfilled in 2007. Projections for these same potential EE occupations forecast as many as 2,300 jobs to be added over the next 5 years in the Seattle-King County region. All but one of the occupations listed – boilermakers – are considered in-demand occupations for the area, as they are key to the growth of the industry. While these numbers total all jobs in the larger building construction industry – green or not – given the large investment in energy efficiency both publically and privately to spur the market, the majority of these newly created openings will be touched in part or wholly by green skills, materials, and projects.

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13 Community Jobs in the Green Economy. Apollo Alliance/Urban Habitat. 2007.

14 "Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy" March 2008. Sarah White & Jason Walsh. Center on Wisconsin Strategy, The Workforce Alliance, The Apollo Alliance

Seattle-King County WDA Energy Efficiency Job Projections\*

Occupation	Average Education Level (BLS)†	Estimated Job Vacancies 2007**	2009 Estimated Employment***	Avg. Annual Opening Due to Growth 2009-2014***	2014 Estimated Employment***	Median March 2007 wage*****
Carpenters	Long-term OJT	221	14,807	166	15,636	\$53,310
Construction Laborers	Moderate-term OJT	133	9,802	113	10,369	\$31,855
Electricians	Long-term OJT	51	4,668	54	4,936	\$53,796
Plumbers, Pipefitters, and Steamfitters	Long-term OJT	36	4,305	43	4,519	\$59,443
Sheet metal workers	Moderate-term OJT	18	3,429	37	3,616	\$46,348
Heating, AC, and Refr. Mechs and Installers	Long-term OJT	55	1,655	17	1,741	\$54,691
Cement Masons and Concrete Finishers	Long-term OJT	20	1,453	18	1,542	\$58,839
Insulation workers, floor, ceiling, and wall	Moderate-term OJT	20	517	6	547	\$51,101
Hazardous materials Removal Workers	Moderate-term OJT	0	543	15	619	\$56,817
Boilermakers‡	Long-term OJT	0	148	1	152	\$44,336

\*EE occupations in this chart come from "Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy" March 2008. Sarah White & Jason Walsh. Center on Wisconsin Strategy, The Workforce Alliance, The Apollo Alliance: p. 16.

\*\* Vacancy data from the Washington State Employment Security Department Fall 2007 Job Vacancy Survey. These are current openings reported by firms that they are actively trying to fill.

\*\*\* Occupational Employment Projections, June 2007, Washington Employment Security Department, Labor Market and Economic Analysis Branch

\*\*\*\* Employment projection totals include both replacement and new job openings.

\*\*\*\*\* Wage Data from Bureau of Labor Statistics Occupational Employment Statistics Wage Survey – March 2007.

† Moderate-term on-the-job training requires from one to twelve months of training, which typically occurs at the workplace. Long-term on-the-job training requires more than one year of on-the-job training, or combined work experience and classroom instruction, and may include apprenticeships of up to five years.

‡ Boilermaker is not an occupation in demand for Seattle-King County.

## Seattle’s Commercial Energy Efficiency Retrofit Job Potential

To complement the general EE sector job projections above, the Center on Wisconsin Strategy (COWS) was commissioned to model the specific job creation potential of direct investment into energy efficiency retrofitting for commercial buildings in Seattle over the next 5 years. The model is based on construction estimation techniques, using budget information from Seattle City Light’s 5-year conservation plan, union wage rates, and national survey information to assess the labor content in various types of energy efficiency (EE) retrofit work. (See *Appendix for details on inputs, methodology and full results tables*). The following table details the outcomes from this modeling process, communicated in job-years. A job-year is characterized as full-time work for one employee for one year.<sup>15</sup>

Estimated Job-Years per \$1 million invested in EE measures (COWS)

	Supervisor	Skilled	Semi-skilled	Entry-level	Total
<b>#101 Office</b>					
Lighting	0.3	1.2	1.7	1.3	4.6
HVAC	0.2	0.6	0.8	0.7	2.3
<b>#101 Institutional</b>					
Lighting	0.3	1.2	1.7	1.3	4.6
HVAC	0.2	0.6	0.8	0.7	2.3
<b>#104 Grocery</b>					
Lighting	0.4	1.7	2.3	1.9	6.3
HVAC	0.0	0.2	0.2	0.2	0.7
<b>#106 Lighting trade ally</b>					
Lighting	0.5	1.9	2.6	2.1	7.0
<b>#310 Low-Income Single &amp; Multi-Family</b>					
Building envelope	1.0	3.6	3.9	3.4	11.9

The overall findings indicate that for every \$1 million dollars invested in these particular commercial energy efficiency retrofit programs, 7.37 FTEs are created over all programs for the next 5 years.<sup>16</sup>

These findings confirm that the commitment to energy efficiency through investment and policy will create many opportunities for green collar jobs in the EE sector – those skilled and semi-skilled positions in the trades that are vital to the commercial retrofit projects of the future. The level of growth of these local EE sector jobs is contingent on the specific policies and investments undertaken by the City of Seattle as well as state and federal governments.

Regardless of the extent of the increase in demand, the potential job growth of the EE sector, as with other green job sectors, will likely be checked by the looming labor shortage within traditional sector counterparts in terms of both quantity and quality of available workers.<sup>17</sup> In terms of quantity, one major reason for the worker

<sup>15</sup> A job-year is based on 2080 hours (40 hours x 52 weeks), including discounts for vacation = annual FTE.

<sup>16</sup> The findings for Seattle’s EE investment job creation potential is somewhat lower than COWS findings at the national level, due primarily to higher than average loaded wage rates, compared to the national survey.

<sup>17</sup> See Memo “A Green Economy Primer”

shortage locally is the aging demographic. While Washington State has seen a 62% increase in registered apprentices over the last 2 years, the need to fill positions increasingly vacated by a retiring workforce presents a hurdle.<sup>18</sup> Another contributing factor to the skilled labor shortage is the lack of interest among young people in entering the trades. The shortage is exacerbated by the decline of vocational training and career education in schools.<sup>19</sup>

Much of the worker shortage can be attributed to quality issues, specifically a lack of individuals with job-specific skills. Washington employers continue to report difficulty finding qualified applicants to fill their openings, with the shortage being greatest in those positions requiring some form of post-secondary training.<sup>20,21</sup>

This perfect storm of shortage in skills, numbers, interest and investment, especially with the projected growth in EE sector jobs, will likely mean a devastating shortfall in just a decade or two.<sup>22</sup> At the same time, the potential exists to promote policies that are both beneficial to the environment while creating opportunities for individuals to get on pathways towards these much-needed living wage careers. The creation of these pathways requires accessible and applicable training in the skills required for the work ahead.

### **Local Training Opportunities in Energy Efficiency**

Efforts are developing to meet the demand of the local green economy by preparing workers, especially those with low-skills, to take advantage of emerging opportunities. In King County, a variety of opportunities exist for training in Energy Efficiency.<sup>23</sup>

Pre-apprenticeship training is available to provide opportunities for those individuals traditionally not represented in the trades – women and people of color – to work towards a career in construction. Though not required for placement in apprenticeships, they are often a good entry point for people in need of basic skills and on-the-job training. These programs aim to prepare people for the rigors of the job, leading in most cases to apprenticeship placement where they gain on-the-job hard skills applicable to their chosen trade. The pre-apprenticeship programs provide instruction on both the soft and hard skills necessary to gain access to apprenticeships and secure future employment in the construction industry.

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18 State falling short on labor needs in trades, high tech. Seattle Post-Intelligencer. Amy Rolph. March 26, 2008.

19 State falling short on labor needs in trades, high tech. Seattle Post-Intelligencer. Amy Rolph. March 26, 2008.

20 Washington State Workforce Education and Training Board. Washington State Employers' Workforce Training Needs and Practices, 2006.

21 Washington State Workforce Education and Training Board, Postsecondary Career & Technical Education Works, 2007.

22 State falling short on labor needs in trades, high tech. Seattle Post-Intelligencer. Amy Rolph. March 26, 2008.

<sup>23</sup> See Memo "A Green Economy Primer" for more detail

Institution	Length of Training	Slots per class/per year
Seattle Vocational Institute	2 quarters	15 students per class 30 students per year
Renton Technical College	2 quarters	15 students per class 30 students per year
South Seattle Community College	1 quarter	15-20 students per class 60 students per year
Total Pre-Apprenticeship training slots		120

Some community and technical colleges currently offer programs that feed into the Energy Efficiency industry sector, and have begun to implement certificate and degree programs specifically geared towards the growing green economy.

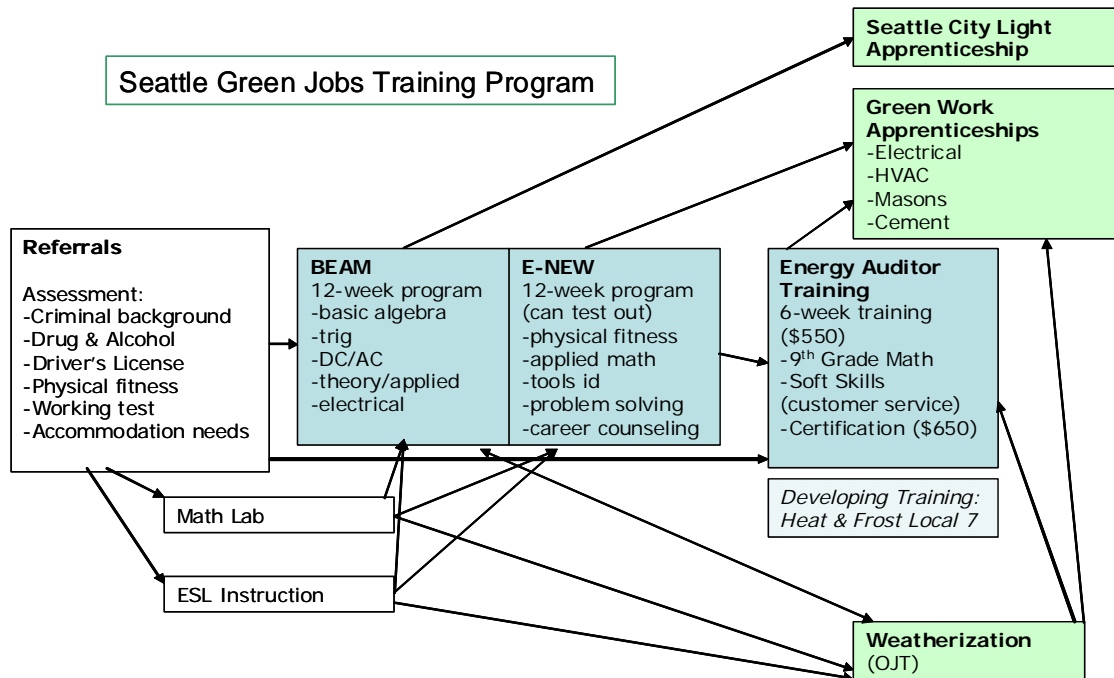
- Seattle Central Community College runs a Sustainable Building Advisor program intended primarily for building industry professionals (architects, engineers, developers) which meets on weekends over the course of 9-months.
- South Seattle Community College is currently conducting a 6-week Residential Energy Auditor Training course, designed to prepare students to take the national energy auditor certification exam upon completion.
- South Seattle Community College is also planning to develop curricula to teach building management, focusing on maintenance, operations and energy efficiency.
- Shoreline Community College currently offers a 5-week certificate program in Solar/Photovoltaic Design, intended for those individuals with some background and field experience in environmental sciences and experience in electrical work and/or design and construction.
- Shoreline Community College will also start a certificate program in Zero Energy Building in the Fall of 2008.
- Green River Community College offers certificate and AAS degree programs in Water Supply and Wastewater Technologies.

In general, currently available training opportunities trend towards workshops for the general public or industry professionals, with only a handful of articulated curriculums aimed at preparing students for middle-skilled occupations in the growing green economy. Many programs, however, are still in the planning stages.

One promising opportunity in development is that of a Seattle Green Jobs Training Program. Using its strong connections to the trades and apprenticeship programs at the Georgetown Campus of South Seattle Community College, the Puget Sound Industry and Excellence Center (PSIEC)<sup>24</sup> is creating an articulated pipeline into green work through 12-week training programs and additional remediation efforts. The following flow chart examines the proposed pipeline:

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<sup>24</sup> PSIEC is a collaboration between business, labor, industry and education, and currently houses training for 25 apprenticeship programs



The core of this pipeline rests on two existing programs – Seattle City Light’s Pre-Apprenticeship Basic Electric and Applied Math training (BEAM) and Apprenticeship and Nontraditional Employment for Women (ANEW). The BEAM program provides contextualized math training for individuals interested in entering the Seattle City Light Lineworker Pre-Apprenticeship Program, while the E-NEW training (A-NEW with an eye towards green apprenticeships) is a retrofit of the current A-NEW pre-construction training program currently housed at PSIEC, with the idea incorporating modified skills for greening trades.

This pipeline aims at moving individuals with little or no background in the trades through programs that are suited to their entry skill level and aptitude. Those who pass initial assessment tests in English as a second language, math, physical, and personal background thresholds can enter either the BEAM or E-NEW programs, which function as preapprenticeship programs for the Green Work trades. Individuals who require further assistance on math or English may be provided opportunities to work on these in Math and English remediation courses. This pipeline is still in the planning stages, with hopes to roll out training by Fall 2008.

### EE Residential Retrofit: Low-Income Home Weatherization

To help meet the Mayor’s energy efficiency objectives for the City, an opportunity to help Seattle residents with their energy bills while providing job potential may exist in home weatherization. The HomeWise Weatherization and Home Repair Program, operated through the City of Seattle’s Office of Housing, is a program already aimed at the Mayor’s energy efficiency targets. At the same time, as outlined in the proposed Seattle Green Jobs Training Program, weatherization may present an opportunity to create an on-ramp for low-income/low-skill individuals into green jobs and pathways to living-wage green careers.

Each year, millions of dollars are allocated through the federal Weatherization Assistance program to state agencies and then to local agencies to perform energy

audits and retrofits for low-income home owners. For the HomeWise Program, total funding from the Department of Energy, Health and Human Services, Bonneville Power Association, WA CTED, PSE, and Seattle City Light, was roughly \$3.2 million for 2007.

Weatherization is the application of energy efficiency measures to a home. These may include air sealing measures such as weather-stripping and caulking, insulation measures to ceiling, wall and floor areas and related-repair measures. Installing insulation, improving furnace systems, reducing airflow through buildings, repairing chimneys, installing control devices, improving lighting systems, and other tasks are performed in the course of the work. Measures are installed according to established technical specifications, cost effectiveness tests, and applicable building codes using crews and specialty subcontractors.

Weatherization programs examine single and multi-dwellings as well as mobile homes for existing heat loss conditions. A basic search for insulation contractors in Seattle results in roughly 20 companies that perform resident performance measures.<sup>25</sup> The HomeWise Program works with private sector contractors hired to install energy conservation measures free of charge to those Seattle residents who qualify. To qualify, household income must be between 50% and 80% of the area median income, depending on the funding source. The program currently contracts with 4 companies, two of which are solely OH contractors, and the other 2 are larger companies serving both OH and private applications. These contractors collectively serviced 175-200 single-family homes in 2007 through the HomeWise program, and as many as 500 multi-family units.

Contractors report that it is not easy to find skilled workers to fill their crews for weatherization projects. In general, contractors are hiring individuals who have been doing similar work for other companies, and those new to the work have often been referred by other employees. Further, many of the individuals who come on to crews at the helper level don't stay long. For those who do choose to stick with it, weatherization can be an opportunity to make a decent living – wages start at \$10/hr but an individual can, within a few years, can make up to \$25/hr with benefits. Turnover is low, as the number of crews is small (3-4 crews per company – 3 people on each crew) and the work is dictated by crew availability.

There exist some restrictions to the weatherization workcrew that present barriers for at-risk populations. Specifically, many weatherization contractors require a driver's license, a clean criminal record (no thefts, DUIs, etc), drug testing, and for many the ability to communicate in English for all employees. Skills required include some math capabilities and logic skills.

Career trajectories generally lead those with some tenure in the business from crew member to crew chief to salesperson. For private weatherization contractors, it is the salespeople that perform audits of homes before installation and repair, and therefore previous experience actually performing the work becomes a valuable skill for estimation jobs. The OH HomeWise program has five field staff who perform these energy audits before it assigns work to its contractors.

While there are no required trainings to move up the career ladder in the weatherization business, there do exist opportunities for training. Some training is useful for tasks like duct sealing, blower door, safety testing, and weatherization codes. In these cases, occasionally on-site training is provided as needed and/or paid for by the contractor. In some cases, lead paint training is required. At the same

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<sup>25</sup> [http://seattle-wa.yellowusa.com/Insulation\\_Contractors.html](http://seattle-wa.yellowusa.com/Insulation_Contractors.html)

time, the nature of the work provides an introduction to a variety of other construction skills. Overall, though, there is no formal training or training track into or out of weatherization work.

As with a majority of construction work, home performance and weatherization is seasonal. When the volume is high, often work is back-logged due to the paucity of available skilled crews. While this may serve as an opportunity to hire new blood to keep up with the work, many contractors do not for fear of having to let them go. In addition, new individuals brought on in the height of a season must be ready and skilled for the work right away.

## **Energy Efficiency Efforts by Other U.S. Cities**

The Mayor's objectives around creating energy efficiency align with work being done in other major cities around the country. Summarized below are a few programs in various stages of implementation that seek to address energy efficiency and green jobs goals. For more information on the programs listed here, reference "Green Collar Jobs in America's Cities: Building Pathways out of Poverty and Careers in the Clean Energy Economy" by the Apollo Alliance and Green for All with the Center for American Progress and the Center on Wisconsin Strategy (2008) and "Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy" by Sarah White & Jason Walsh and released by the Center on Wisconsin Strategy, The Workforce Alliance, and The Apollo Alliance (2008).

- Chicago, IL: Mayor Daley has declared his intention to transform Chicago into the "the greenest city in America," and green jobs are a key component of this effort. Programs include GreenCorps Chicago and Chicagoland Green-Collar Jobs Initiative. The Initiative, founded in September 2007, aids in the development of workforce programs that will prepare workers for emerging green jobs related to sustainability, natural resource conservation, and environmental technology. In addition, COWS is working with the Center for Urban Economic Development at the University of Illinois at Chicago on a 6-month project to assess Chicago's Climate Change Action Plan in terms of job creation potential, green job career ladders, training capacity, and potential green technology business stimulation.
- New York, NY: In April 2007, Mayor Bloomberg released PlaNYC 2030: 127 initiatives with 10 major goals. In the fall of 2007 the City Council's Climate Protection Act codified the goal of reducing citywide greenhouse gas emissions 30% by 2030. As an advisor to the PlaNYC creation process, the New York City Apollo Alliance pushed for a commitment to retrofit municipal buildings to reduce energy use, lower greenhouse gas emissions and create jobs, resulting in the City's 10-year planned investment of almost \$1 billion dollars in municipal retrofits and new technologies. A Green-Collar Jobs Planning Commission was created 2008, with a key objective being to develop strategies to ensure that New York City's sustainability efforts create good green-collar jobs, accessible to all New Yorkers.
- Milwaukee, WI: Milwaukee Energy Efficiency, or Me2, was launched in 2007 by the city and COWS. The program will coordinate assessment and installation of efficiency measures, and pre-arranged private financing for building owners in the city. Me2 will train and employ Milwaukee residents of underserved communities to do much of the work, estimated at up to 7,000 person-years for efficiency-measure installation.



- Oakland, CA: The Green Collar Jobs Campaign, coordinated through Ella Baker Center, aims to catalyze pilot projects to employ people in the green economy, supported by policy advocacy and public outreach. One pilot project includes the Oakland Green Jobs Corps, which provides training for green careers for Oakland residents with barriers to employment.
- Los Angeles, CA: Mayor Villaraigosa signed the Apollo Challenge in August 2006, as part of the LA Green Jobs Campaign spearheaded by the Los Angeles Apollo Alliance. In June 2007, the city council created a City Retrofits Jobs Task Force to coordinate and lead the city's building retrofit efforts, which include identifying workforce needs and financing mechanisms for the work. The city is also in the process of developing a Green Careers Training Initiative, which aims to connect low-income residents to apprenticeships and community college training programs in the growing green economy.
- Washington DC: Mayor Fenty is creating a "Green Jobs Advisory Council," with a priority goal to create a comprehensive energy policy that promotes energy efficiency and renewable energy installations.

These and other campaigns, initiatives, and programs in various stages of planning and implementation are on the vanguard of efforts to prepare workforces for a new economy defined by energy efficiency and sustainable practice. For Seattle, next steps include implementing further policy that will encourage progress towards the Mayor's goals while at the same time creating opportunities for those residents most in need of pathways out of poverty.

### **Moving Forward: Opportunities and Next Steps**

All signs indicate that the greening of the local economy has begun to reshape local workforce needs. In order to make sure there is a body of skilled individuals ready for the green work ahead, we must first make sure that policies are in place to encourage those businesses and employers most effected by green shifts, creating incentives for practices and programs that move Seattle towards the Mayor's goals of energy reduction while promoting opportunities for living wage careers in green work.<sup>26</sup> Further, we must understand how those polices will impact job growth and training potential in the region.

- A first step in moving forward with a city-based plan for energy efficiency and green job growth is to understand the local impacts of state and federal legislation, particularly for job growth and training potential.
  - As part of the 2007 Energy Bill, the Green Jobs Act makes \$125 million a year available across the country to begin training 35,000 people annually for jobs in the clean energy sector, emphasizing jobs created by a green economy that are pathways out of poverty.<sup>27</sup>
  - At the state level, a first-in-the nation Climate Action and Green Jobs bill passed by the Washington legislature simultaneously aims to cut greenhouse gas emissions statewide and increase the number of

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<sup>26</sup> See policy recommendations informed by national campaigns in SJI's Memorandum, "A Green Economy Primer".

<sup>27</sup> Brita Belli. *Welcome to Green-Collar America*. Emagazine.com: Vol.18 Number 6, November/December 2007.

“green economy” jobs to 25,000 by 2020 through investment in worker training.<sup>28</sup>

- **What will these measures mean for Seattle in terms of investment in current or new training opportunities?**
  - Further, as part of the Climate Action and Green Jobs Bill, the Washington State Employment Security Department has been tapped to head up research on the green labor market.
- **How will this research provide further clarity on the present and future supply and demand for a green workforce in Seattle?**
- In order to determine what a 20% reduction in energy usage in the City of Seattle translates into in terms of jobs—in particular middle-wage jobs—we will need to gain a better understanding of how exactly this reduction will be achieved. For example, how many home retrofits will be targeted as part of the city’s strategy? While the COWS modeling outlined in this work is useful, providing a similar modeling for the potential of home weatherization retrofits to create new jobs will require knowledge of the investment to be made.

While efforts are required to further understand the growing green market, local business and job growth potential, the research outlined in this document clearly points to a need to build the capacity of already existing training pathways as a fundamental point of departure for skilled living wage trades work in energy efficiency.

- As is evident, many of the jobs associated with energy efficiency retrofitting look a lot like traditional construction jobs.<sup>29</sup> Therefore, critical to creating opportunities for low-income, low-skill Seattle residents to move into burgeoning green jobs is emphasizing training in already existing apprenticeship opportunities and similar programs. Continued work should be done in partnership with local unions to ensure a workforce adequate to meet demand, such as seeking to double pre-apprenticeship training slots in King County from approximately 120 students to 240 students.
- To help prepare those interested in trades apprenticeships that will require new skills, emphasis should be placed on adding math rigor (pre-algebra) and other higher level skills development to pre-apprenticeship training to help people be competitive for entry into the higher-skilled trades heavily depended on in the EE sector.
- To meet the Mayor’s interest in cost-savings for struggling homeowners through energy conservation measures, one option is to double the size of the home weatherization program (HomeWise) from \$3 million to \$6 million to serve up to 400 single family homes and 1,000 multi-family units per year. This would have the effect of doubling weatherization crews from 48 total workers (12 per participating company) to 96 workers. The weatherization workforce would increase substantially if the city’s efforts included mandates or incentives for all Seattle homeowners to weatherize their homes. The city might consider working with labor unions to determine how to connect

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<sup>28</sup> Stiffler, Lisa and Chris McGann. *Bill orders firm steps to make state ‘greener’*. Seattle Post-Intelligencer, February 19, 2008.

<sup>29</sup> “Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy” March 2008. Sarah White & Jason Walsh. Center on Wisconsin Strategy, The Workforce Alliance, The Apollo Alliance

weatherization jobs, which presently offer relatively low pay and limited career advancement, to career pathways within the trades.

- Currently, apprenticeship utilization requirements exist for all public construction projects. A possible avenue may be to create incentives for private sector commercial retrofit projects to utilize more apprenticeships throughout energy efficiency work.

Clearly, continued research into the growing opportunities and potential job creation of the green economy is needed. We welcome your insight and guidance about next steps to further this discussion.

## Key Resources for this Work

- "Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy" 2008. Sarah White & Jason Walsh. Center on Wisconsin Strategy, The Workforce Alliance, The Apollo Alliance.
- "Green Collar Jobs in America's Cities: Building Pathways out of Poverty and Careers in the Clean Energy Economy" 2008. Kate Gordon and Jeremy Hays. Apollo Alliance, Green for All, Center for American Progress, Center on Wisconsin Strategy.
- "Green Collar Jobs: An Analysis of the Capacity of Green Businesses to Provide High Quality Jobs for Men and Women with Barriers to Employment" 2007. Raquel Pinderhughes. City of Berkeley Office of Energy and Sustainable Development.
- "Capturing the Energy Opportunity: Creating a Low-Carbon Economy" 2007. John Podesta, Todd Stern, Kit Batten. Center for American Progress.
- "Community Jobs in the Green Economy" 2007. Kate Gordon, Jeremy Hays, Leon Sompolinsky, Elizabeth Tan, Jackie Tsou. Apollo Alliance, Urban Habitat
- "Renewable Energy and Energy Efficiency: Economic Drivers for the 21<sup>st</sup> Century" 2007. Roger Bezdek. American Solar Energy Society
- "Green Cities, Green Jobs" 2007. Joanna Lee, Angela Bowden, Jennifer Ito. Cipher/Scope.
- "Jobs in L.A.'s Green Technology Sector" 2006. Patrick Burns, Daniel Flaming. Economic Roundtable.
- "New Energy for Cities – Energy Saving & Job Creation Policies for Local Governments" 2006. Kate Gordon, Matt Myrl, Satya Rhode-Conway, Brian Siu. Apollo Alliance
- "Poised for Profit: How Clean Energy Can Power the Next High-Tech Job Surge in the Northwest" 2001. Climate Solutions



**ENERGY EFFICIENCY INDUSTRY - Occupations**

HS DIPLOMA → OJT → 1 yr PSE → 2 year PSE → 4 year Degree → Additional Training → Post-Graduate Degree

**ENERGY/PUBLIC UTILITIES**

**Scientists** - Geoscientist/  
Materials Scientist/ Chemist/  
Geochemist/ Physicist/  
Geophysicist/ Environmental  
Scientist/ Materials Scientist/  
Health Physicist/ Biochemist/  
Agricultural Scientist/  
Microbiologist/ Ecologist/  
Hydrologist/ Meteorologist/  
Botanist/ Geologist

**CONSTRUCTION**

Urban Planner  
Architects, Buildings

**MANUFACTURING**

Assemblers  
Fitters  
Setters, operators &  
tenders  
Machinists  
Welding, soldering, and  
brazing workers  
Deconstruction workers

**OTHER**

Business & Financial  
Management  
Sales  
Research & Development

**Engineers** - Nuclear/ Electrical/ Chemical/ Biological/ Mechanical/  
Aeronautical/ Heating/ Operations/ Reactor/ Senior Reactor/  
Maintenance/ Electronics/ Instrumentation Controls / Fire  
Protection/ Reservoir/ Hydraulic/ Fluid Flow/ Ceramic/ Polymer/  
Automotive/ Industrial Automation/ Civil/Structural

**Managers** – Recreation/ Resource/ Operations/ Engineering/

Executive Secretaries

**Skilled Trades** – Boilermakers/ Electricians/ Architectural drafters/  
Plumbers and Pipefitters/ Sheet metal workers/ Maintenance &  
Repair workers/ Carpenters/ Glazers/ Masons/ Millwright/ Cost  
estimator

**Operators** - Wastewater treatment/ Senior Reactor/ Licensed Reactor/ Non-licensed Reactor/ Plant  
operators/ Equipment/Service Unit

Driller  
Mud Logger  
Farmers  
Foresters  
Landscapers

**Technicians** - Mechanical/ Electrical/ Service/  
Installer (HVAC/insulation/solar panels/Power-line/control devices)  
Maintenance

Secretaries  
Bookkeepers  
Office clerks  
Customer service

**Skilled Trades** Apprentices

Computer specialists/ Industrial mechanics/ Auditors (energy & water)  
Power distributors/ Meter readers

Helpers/ Laborers/ Refuse & recyclable collectors/ Insulation workers

## COWS Energy Efficiency Job Creation Potential Model

The Center on Wisconsin Strategy was commissioned to model the job creation potential of investment in energy efficiency retrofitting for commercial buildings in Seattle.

To estimate the potential jobs created through investment in energy efficiency, a model created by Center on Wisconsin Strategy was used. This model is based on construction estimation techniques to assess the labor content in various types of energy efficiency (EE) retrofit work.

### Inputs

Table 1 details the investment breakdowns for retrofits, based on information from Seattle City Light and the City of Seattle Office of Housing HomeWise Program.

Table 1. Investment breakdowns for Commercial Energy Efficiency Retrofits

	Lighting	HVAC	Building Envelope
#101 Office	65%	35%	0%
#101 Institutional	65%	35%	0%
#104 Grocery Store	90%	10%	0%
#106 Lighting Trade Ally	100%	0%	0%
#310 Low-Income Single & Multi-Family†	0%	0%	100%

† Information from City of Seattle Office of Housing HomeWise Program - assumes standard annual investment as in 2007.

**Details of the investment breakdown used in this modeling are withheld.**

Another key component in the model are loaded labor wage rates for the various trades employed in energy efficiency retrofits, detailed in Table 2.

Table 2. Wage Rates for Energy Efficiency Retrofit Trades

	Electrical <sup>1</sup>	HVAC <sup>2</sup>	Air leaks <sup>3</sup>	Insulation <sup>3</sup>
<u>Base Hourly</u>				
Supervisor	\$44.32	\$40.03	\$19.38	\$27.12
Skilled	\$40.62	\$38.29	\$18.17	\$25.13
Semi-Skilled	\$20.31	\$20.88	\$14.53	\$13.51
Entry-level	\$14.77	\$16.36	\$9.69	\$10.90
<u>Loaded Hourly</u>				
Supervisor	\$56.09	\$60.99	\$30.60	\$42.82
Skilled	\$52.50	\$59.25	\$28.75	\$39.76
Semi-Skilled	\$32.80	\$31.74	\$23.11	\$21.49
Entry-level	\$22.39	\$23.87	\$15.51	\$17.45

<sup>1</sup> Based on wage rate information supplied by the Local Union 46 International Brotherhood of Electrical Workers.

<sup>2</sup> Based on wage rate information supplied by the Western Washington Building Trades Refrigeration Division.

<sup>3</sup> National figures adjusted for Washington with a multiplier of 1.09, based on a survey conducted and multipliers supplied for COWS by the Powell Center for Construction & Environment, University of Florida. Loaded with standard package of benefits.

Finally, labor distributions were required in conjunction with the above wage rates to properly model costs and job creation, and are detailed in Table 3.

Table 3. Labor distributions of trades in Commercial Energy Efficiency Retrofit work

	Percent of EE labor
Supervisor	7%
Skilled	27%
Semi-Skilled	36%
Entry-level	29%

This set of inputs is used in the modeling process to calculate job-years of labor for EE measure installation. The model backs out profit, contractor overhead, and costs for materials, then allocates the remaining funds for installation work based on typical crew makeups.

## Results

Estimated Job-Years per \$1 million invested in EE measures (COWS)

	Supervisor	Skilled	Semi-skilled	Entry-level	Total
<b>#101 Office</b>					
Lighting	0.3	1.2	1.7	1.3	4.6
HVAC	0.2	0.6	0.8	0.7	2.3
<b>#101 Institutional</b>					
Lighting	0.3	1.2	1.7	1.3	4.6
HVAC	0.2	0.6	0.8	0.7	2.3
<b>#104 Grocery</b>					
Lighting	0.4	1.7	2.3	1.9	6.3
HVAC	0.0	0.2	0.2	0.2	0.7
<b>#106 Lighting trade ally</b>					
Lighting	0.5	1.9	2.6	2.1	7.0
<b>#310 Low-Income Single &amp; Multi-Family</b>					
Building envelope	1.0	3.6	3.9	3.4	11.9



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**2008 – 2012**

**ACTION PLAN**

Conservation Resources Division

Seattle City Light

*Building a World-Class Conservation Power Plant:  
One Customer at a Time*

September 16, 2008

***Volume 2: Technical Appendix***



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## *Appendix F: Detailed Portfolio Worksheets*

The following tables present the year-by-year assumptions of the Five Year Plan by sector and program or functional area. Budget figures (Table F-1) are presented first, followed by positions (Table F-2, expressed in terms of Full Time Equivalents of FTEs), and finally energy savings (Table F-3).

Table F-1

Budget									
Number	Current or New Program	Program Name	2008	2009	2010	2011	2012	Total (2008-2012)	% of Total Budget
<b>Commercial</b>									
101	Current	ESS - Commercial Retrofit	\$2,419,245	\$3,056,613	\$5,379,270	\$5,874,109	\$6,463,101	\$23,192,339	12.5%
102	New	New Commercial - Whole Building	\$0	\$498,236	\$765,929	\$1,103,001	\$1,228,237	\$3,595,403	1.9%
103	Current	Energy Smart Services - New Construction	\$1,173,075	\$1,233,742	\$1,432,992	\$1,512,215	\$1,500,564	\$6,852,588	3.7%
104	New	Grocery Store Initiative	\$89,460	\$478,532	\$0	\$0	\$0	\$567,992	0.3%
105	Current	Smart Business	\$720,655	\$850,724	\$1,243,516	\$1,401,624	\$1,436,214	\$5,652,733	3.0%
106	New	Lighting Trade Ally Program	\$2,756,053	\$4,594,809	\$6,377,583	\$8,374,371	\$8,578,031	\$30,680,847	16.5%
107	New	Retro-commissioning/Commissioning - Resource Conservation Manager	\$0	\$491,664	\$503,611	\$567,434	\$581,223	\$2,143,932	1.2%
108	New	Energy Efficient Data Centers	\$0	\$82,596	\$84,744	\$95,642	\$98,129	\$361,111	0.2%
109	New	Financing Options	\$0	\$82,596	\$84,744	\$95,642	\$98,129	\$361,111	0.2%
110	New	Energy Efficiency Fund (Public Sector Loans)	\$0	\$4,180,122	\$84,744	\$95,642	\$98,129	\$4,458,637	2.4%
<b>Commercial Sector Program Subtotal</b>			<b>\$7,158,488</b>	<b>\$15,549,635</b>	<b>\$15,957,133</b>	<b>\$19,119,681</b>	<b>\$20,081,755</b>	<b>\$77,866,693</b>	<b>41.8%</b>
<b>Industrial</b>									
201	Current	ESS - Industrial	\$1,716,876	\$2,350,527	\$3,098,818	\$3,714,694	\$3,899,958	\$14,780,874	7.9%
202	New	Simple Compressor Rebates	\$0	\$47,118	\$48,263	\$54,379	\$55,701	\$206,460	0.1%
<b>Industrial Sector Program Subtotal</b>			<b>\$1,716,876</b>	<b>\$2,397,645</b>	<b>\$3,147,081</b>	<b>\$3,769,073</b>	<b>\$3,955,658</b>	<b>\$14,986,334</b>	<b>8.1%</b>
<b>Residential</b>									
302	Current	Multifamily New Construction - Built Smart	\$975,475	\$1,024,186	\$1,049,589	\$1,107,975	\$1,135,503	\$5,292,728	2.8%
303	Current	Common Area Lighting	\$178,110	\$183,060	\$187,611	\$211,502	\$216,760	\$977,043	0.5%
304	Current	Multifamily Weatherization	\$517,545	\$530,743	\$543,743	\$612,767	\$627,775	\$2,832,573	1.5%
305	Current	CFL Retail Program - Twist and Save	\$1,373,443	\$2,410,775	\$2,469,381	\$2,756,559	\$2,823,571	\$11,833,729	6.4%
306	Current	Wash Wise	\$215,943	\$221,334	\$173,621	\$195,650	\$200,432	\$1,006,979	0.5%
307	Current	Refrigerator Recycling	\$273,313	\$546,549	\$423,459	\$435,238	\$302,738	\$1,981,296	1.1%
308	Current	Residential Lighting	\$203,443	\$208,530	\$213,621	\$220,301	\$225,682	\$1,071,576	0.6%
309	Current	Neighborhood Power Project	\$89,823	\$120,632	\$123,671	\$126,802	\$130,013	\$590,941	0.3%
310	Current	Low Income: Single and Multifamily	\$2,106,175	\$2,160,031	\$2,160,393	\$2,214,379	\$2,268,216	\$10,908,194	5.9%
311	New	Retail Big Box	\$0	\$154,211	\$158,080	\$170,645	\$174,921	\$657,857	0.4%
312	New	In Home Monitors	\$70,000	TBD	TBD	TBD	TBD	\$70,000	TBD
313	New	Home Audits/Home Use Support	\$400,000	TBD	TBD	TBD	TBD	\$400,000	TBD
314	New	LEED for New Homes	Planning	TBD	TBD	TBD	TBD	TBD	TBD
<b>Residential Sector Program Subtotal</b>			<b>\$6,402,269</b>	<b>\$7,560,051</b>	<b>\$7,503,168</b>	<b>\$8,051,819</b>	<b>\$8,105,611</b>	<b>\$37,622,917</b>	<b>20.2%</b>
<b>Mixed Use</b>									
401	New	Mixed Use New Construction	\$0	\$141,526	\$168,933	\$197,868	\$202,839	\$711,165	0.4%
<b>Mixed Use Program Subtotal</b>			<b>\$0</b>	<b>\$141,526</b>	<b>\$168,933</b>	<b>\$197,868</b>	<b>\$202,839</b>	<b>\$711,165</b>	<b>0.4%</b>
<b>Renewable</b>									
501	Current	Green Power	\$132,456	\$263,899	\$281,368	\$288,237	\$295,274	\$1,261,233	0.7%
502	Current	Green Up	\$145,912	\$381,146	\$365,863	\$374,942	\$384,247	\$1,652,109	0.9%
503	New	On-Site Renewable Power & Cogen Program	\$0	\$72,267	\$179,145	\$129,849	\$133,133	\$514,394	0.3%
504	New	Small Scale Renewable Incentive Program	\$0	\$36,134	\$89,573	\$64,924	\$66,567	\$257,197	0.1%
505	New	WA State Renewable Production Incentive	\$42,456	\$118,067	\$319,536	\$448,893	\$845,113	\$1,774,064	1.0%
506	New	Home Power Program with Financing	\$0	\$36,134	\$37,073	\$38,036	\$39,025	\$150,268	0.1%
<b>Renewable Program Subtotal</b>			<b>\$320,823</b>	<b>\$907,645</b>	<b>\$1,272,557</b>	<b>\$1,344,881</b>	<b>\$1,763,359</b>	<b>\$5,609,265</b>	<b>3.0%</b>
<b>Other</b>									
601	New	Demand Respose - Residential and Commercial	\$100,000	\$69,565	\$173,374	\$185,031	\$189,664	\$717,635	0.4%
602	Current	Green Building Team	\$250,000	\$411,000	\$411,000	\$420,987	\$431,217	\$1,924,205	1.0%
603	Current	Lighting Design Lab	\$600,848	\$1,005,163	\$1,070,387	\$1,143,840	\$1,172,691	\$4,992,928	2.7%
604	Current	Northwest Energy Efficiency Alliance	\$630,000	\$630,000	\$815,000	\$834,805	\$855,090	\$3,764,895	2.0%
605	Current	Seattle Energy Code	\$375,000	\$370,000	\$370,000	\$378,991	\$388,200	\$1,882,191	1.0%
606	Current	SCL Infrastructure Improvements	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Other Program Subtotal</b>			<b>\$1,955,848</b>	<b>\$2,485,728</b>	<b>\$2,839,761</b>	<b>\$2,963,654</b>	<b>\$3,036,863</b>	<b>\$13,281,854</b>	<b>7.1%</b>
<b>All Programs Subtotal</b>			<b>\$17,554,305</b>	<b>\$29,042,229</b>	<b>\$30,888,633</b>	<b>\$35,446,975</b>	<b>\$37,146,085</b>	<b>\$150,078,228</b>	<b>80.6%</b>
<b>Infrastructure</b>									
701		Management	\$768,767	\$893,765	\$917,005	\$958,237	\$983,151	\$4,520,924	2.4%
702		Support - Labor	\$501,683	\$519,242	\$532,744	\$546,595	\$560,807	\$2,661,071	1.4%
703		Planning & Evaluation	\$1,227,743	\$2,070,742	\$3,236,489	\$3,395,755	\$3,480,151	\$13,410,880	7.2%
704		Information Management	\$0	\$512,000	\$1,575,000	\$524,442	\$0	\$2,611,442	1.4%
705		Intern Program	\$0	\$200,000	\$210,000	\$215,103	\$220,330	\$845,433	0.5%
706		Marketing	\$324,904	\$690,792	\$849,613	\$878,074	\$899,929	\$3,643,313	2.0%
707		Miscellaneous	\$380,000	\$790,428	\$883,586	\$905,057	\$927,050	\$3,886,121	2.1%
708		M&V	\$0	\$1,087,589	\$1,089,866	\$1,116,503	\$1,143,790	\$4,437,748	2.4%
<b>Infrastructure Subtotal</b>			<b>\$3,203,098</b>	<b>\$6,764,558</b>	<b>\$9,294,303</b>	<b>\$8,539,765</b>	<b>\$8,215,208</b>	<b>\$36,016,932</b>	<b>19.4%</b>
<b>Total CRD Budget Request</b>			<b>\$20,757,402</b>	<b>\$35,806,787</b>	<b>\$40,182,936</b>	<b>\$43,986,740</b>	<b>\$45,361,294</b>	<b>\$186,095,159</b>	<b>100.0%</b>
<b>Offsetting Revenue</b>			<b>\$1,283,367</b>	<b>\$1,733,549</b>	<b>\$2,130,447</b>	<b>\$2,303,998</b>	<b>\$2,745,492</b>	<b>\$10,196,854</b>	
<b>Financing Repayments (12-year repayment @ 5%)</b>			<b>\$0</b>	<b>\$0</b>	<b>\$450,000</b>	<b>\$450,000</b>	<b>\$450,000</b>	<b>\$1,350,000</b>	
<b>Net CRD Expenses</b>			<b>\$19,474,035</b>	<b>\$34,073,238</b>	<b>\$37,602,489</b>	<b>\$41,232,742</b>	<b>\$42,165,802</b>	<b>\$174,548,306</b>	<b>--</b>
<b>A&amp;G and Labor Loading Costs</b>			<b>\$5,560,337</b>	<b>\$7,864,116</b>	<b>\$8,530,993</b>	<b>\$8,938,392</b>	<b>\$9,161,015</b>	<b>\$40,054,855</b>	<b>--</b>
<b>Net SCL Cost</b>			<b>\$25,034,372</b>	<b>\$41,937,354</b>	<b>\$46,133,482</b>	<b>\$50,171,135</b>	<b>\$51,326,817</b>	<b>\$214,603,160</b>	<b>--</b>

Table F-2

Energy Savings (MWhs)									
Sector	Current or New Program	Program Name	2008	2009	2010	2011	2012	Total (2008-2012)	% of Total Savings
<b>Commercial</b>									
101	Current	ESS - Commercial Retrofit	9,447	12,053	23,454	22,640	24,595	92,189	16.1%
102	New	New Commercial - Whole Building	0	2,158	3,453	4,533	4,964	15,109	2.6%
103	Current	Energy Smart Services - New Construction	4,317	4,101	4,964	4,533	4,317	22,232	3.9%
104	New	Grocery Store Initiative	1,017	5,309	0	0	0	6,325	1.1%
105	Current	Smart Business	2,700	2,700	3,840	3,840	3,840	16,920	2.9%
106	New	Lighting Trade Ally Program	13,780	22,026	29,989	35,015	35,015	135,825	23.7%
107	New	Retro-commissioning/Commissioning - Resource Conservation Manager	0	2,400	2,400	2,400	2,400	9,600	1.7%
108	New	Energy Efficient Data Centers	0	0	0	0	0	0	0.0%
109	New	Financing Options	0	0	0	0	0	0	0.0%
110	New	Energy Efficiency Fund (Public Sector Loans)	0	0	0	0	0	0	0.0%
<i>Commercial Sector Program Subtotal</i>			<i>31,260</i>	<i>50,747</i>	<i>68,101</i>	<i>72,960</i>	<i>75,131</i>	<i>298,199</i>	<i>52.0%</i>
<b>Industrial</b>									
201	Current	ESS - Industrial	6,397	9,079	12,587	13,619	14,032	55,714	9.7%
202	New	Simple Compressor Rebales	0	200	200	200	200	800	0.1%
<i>Industrial Sector Program Subtotal</i>			<i>6,397</i>	<i>9,279</i>	<i>12,787</i>	<i>13,819</i>	<i>14,232</i>	<i>56,514</i>	<i>9.8%</i>
<b>Residential</b>									
302	Current	Multifamily New Construction - Built Smart	2,522	2,522	2,522	2,522	2,522	12,610	2.2%
303	Current	Common Area Lighting	600	600	600	600	600	3,000	0.5%
304	Current	Multifamily Weatherization	1,110	1,110	1,110	1,110	1,110	5,551	1.0%
305	Current	CFL Retail Program - Twist and Save	26,248	34,451	34,451	34,451	34,451	164,050	28.6%
306	Current	Wash Wise	1,202	1,202	901	901	901	5,106	0.9%
307	Current	Refrigerator Recycling	1,658	3,317	2,488	2,488	1,659	11,609	2.0%
308	Current	Residential Lighting	1,917	1,917	1,917	1,917	1,917	9,583	1.7%
309	Current	Neighborhood Power Project	0	0	0	0	0	0	0.0%
310	Current	Low Income: Single and Multifamily	891	923	923	923	923	4,585	0.8%
311	New	Retail Big Box	0	400	400	400	400	1,600	0.3%
312	New	In Home Monitors	Pilot	TBD	TBD	TBD	TBD	0	0.0%
313	New	Home Audits/Home Use Support	Pilot	TBD	TBD	TBD	TBD	0	0.0%
314	New	LEED for New Homes	Planning	TBD	TBD	TBD	TBD	0	0.0%
<i>Residential Sector Program Subtotal</i>			<i>36,147</i>	<i>46,441</i>	<i>45,312</i>	<i>45,312</i>	<i>44,482</i>	<i>217,694</i>	<i>37.9%</i>
<b>Mixed Use</b>									
401	New	Mixed Use New Construction	0	250	349	400	400	1,399	0.2%
<i>Mixed Use Program Subtotal</i>			<i>0</i>	<i>250</i>	<i>349</i>	<i>400</i>	<i>400</i>	<i>1,399</i>	<i>0.2%</i>
<b>Renewable</b>									
501	Current	Green Power	N/A	N/A	N/A	N/A	N/A	N/A	N/A
502	Current	Green Up	N/A	N/A	N/A	N/A	N/A	N/A	N/A
503	New	On-Site Renewable Power & Cogen Program	N/A	N/A	N/A	N/A	N/A	N/A	N/A
504	New	Small Scale Renewable Incentive Program	N/A	N/A	N/A	N/A	N/A	N/A	N/A
505	New	WA State Renewable Production Incentive	N/A	N/A	N/A	N/A	N/A	N/A	N/A
506	New	Home Power Program with Financing	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>Renewable Program Subtotal</i>			<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<b>Other</b>									
601	New	Demand Respose - Residential and Commercial	N/A	N/A	N/A	N/A	N/A	0	0.0%
602	Current	Green Building Team	N/A	N/A	N/A	N/A	N/A	0	0.0%
603	Current	Lighting Design Lab	N/A	N/A	N/A	N/A	N/A	0	0.0%
604	Current	Northwest Energy Efficiency Alliance	TBD	TBD	TBD	TBD	TBD	0	0.0%
605	Current	Seattle Energy Code	TBD	TBD	TBD	TBD	TBD	0	0.0%
606	Current	SCL Infrastructure Improvements	TBD	TBD	TBD	TBD	TBD	0	0.0%
<i>Other Program Subtotal</i>			<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0.0%</i>
<b>Infrastructure</b>									
701		Management	0	0	0	0	0	N/A	N/A
702		Support - Labor	0	0	0	0	0	N/A	N/A
703		Planning & Evaluation	0	0	0	0	0	N/A	N/A
704		Information Management	0	0	0	0	0	N/A	N/A
705		Intern Program	0	0	0	0	0	N/A	N/A
706		Marketing	0	0	0	0	0	N/A	N/A
707		Miscellaneous	0	0	0	0	0	N/A	N/A
708		M&V	0	0	0	0	0	N/A	N/A
<i>Infrastructure Subtotal</i>			<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<b>Total MWhs</b>			<b>73,804</b>	<b>106,717</b>	<b>126,549</b>	<b>132,491</b>	<b>134,245</b>	<b>573,807</b>	<b>100.0%</b>
<b>Total aMW</b>			<b>8.43</b>	<b>12.18</b>	<b>14.45</b>	<b>15.12</b>	<b>15.32</b>	<b>65.50</b>	<b>100.0%</b>

Table F-3

Full Time Employees (FTEs)								
Sector	Current or New Program	Program Name	2008	2009	2010	2011	2012	Mean (2008-2012)
<b>Commercial</b>								
101	Current	ESS - Commercial Retrofit	9.00	9.00	9.00	9.00	9.00	9.00
102	New	New Commercial - Whole Building	0.00	0.00	0.00	0.00	0.00	0.00
103	Current	Energy Smart Services - New Construction	5.00	5.00	5.00	5.00	5.00	5.00
104	New	Grocery Store Initiative	0.00	0.00	0.00	0.00	0.00	0.00
105	Current	Smart Business	3.00	3.00	4.00	4.00	4.00	3.60
106	New	Lighting Trade Ally Program	0.00	1.00	1.00	1.00	1.00	0.80
107	New	Retro-commissioning/Commissioning - Resource Conservation Manager	0.00	2.00	2.00	2.00	2.00	1.60
108	New	Energy Efficient Data Centers	0.00	1.00	1.00	1.00	1.00	0.80
109	New	Financing Options	0.00	0.50	0.50	0.50	0.50	0.40
110	New	Energy Efficiency Fund (Public Sector Loans)	0.00	0.50	0.50	0.50	0.50	0.40
<i>Commercial Sector Program Subtotal</i>			<i>17.00</i>	<i>22.00</i>	<i>23.00</i>	<i>23.00</i>	<i>23.00</i>	<i>21.60</i>
<b>Industrial</b>								
201	Current	ESS - Industrial	7.00	7.00	7.00	7.00	7.00	7.00
202	New	Simple Compressor Rebates	0.00	0.00	0.00	0.00	0.00	0.00
<i>Industrial Sector Program Subtotal</i>			<i>7.00</i>	<i>7.00</i>	<i>7.00</i>	<i>7.00</i>	<i>7.00</i>	<i>7.00</i>
<b>Residential</b>								
302	Current	Multifamily New Construction - Built Smart	5.00	5.00	5.00	5.00	5.00	5.00
303	Current	Common Area Lighting	1.00	1.00	1.00	1.00	1.00	1.00
304	Current	Multifamily Weatherization	1.00	1.00	1.00	1.00	1.00	1.00
305	Current	CFL Retail Program - Twist and Save	0.20	0.20	0.20	0.20	0.20	0.20
306	Current	Wash Wise	0.20	0.20	0.20	0.20	0.20	0.20
307	Current	Refrigerator Recycling	0.20	0.20	0.20	0.20	0.20	0.20
308	Current	Residential Lighting	0.20	0.20	0.20	0.20	0.20	0.20
309	Current	Neighborhood Power Project	1.00	1.00	1.00	1.00	1.00	1.00
310	Current	Low Income: Single and Multifamily	0.20	0.20	0.20	0.20	0.20	0.20
311	New	Retail Big Box	0.00	1.00	1.00	1.00	1.00	0.80
312	New	In Home Monitors	Pilot	TBD	TBD	TBD	TBD	TBD
313	New	Home Audits/Home Use Support	Pilot	TBD	TBD	TBD	TBD	TBD
314	New	LEED for New Homes	Planning	TBD	TBD	TBD	TBD	TBD
<i>Residential Sector Program Subtotal</i>			<i>9.00</i>	<i>10.00</i>	<i>10.00</i>	<i>10.00</i>	<i>10.00</i>	<i>9.80</i>
<b>Mixed Use</b>								
401	New	Mixed Use New Construction	0.00	1.00	1.00	1.00	1.00	0.80
<i>Mixed Use Program Subtotal</i>			<i>0.00</i>	<i>1.00</i>	<i>1.00</i>	<i>1.00</i>	<i>1.00</i>	<i>0.80</i>
<b>Renewable</b>								
501	Current	Green Power	0.25	0.25	0.25	0.25	0.25	0.25
502	Current	Green Up	0.50	1.50	1.50	1.50	1.50	1.30
503	New	On-Site Renewable Power & Cogen Program	0.00	1.00	1.00	1.00	1.00	0.80
504	New	Small Scale Renewable Incentive Program	0.00	0.50	0.50	0.50	0.50	0.40
505	New	WA State Renewable Production Incentive	0.25	0.25	0.25	0.25	0.25	0.25
506	New	Home Power Program with Financing	0.00	0.50	0.50	0.50	0.50	0.40
<i>Renewable Program Subtotal</i>			<i>1.00</i>	<i>4.00</i>	<i>4.00</i>	<i>4.00</i>	<i>4.00</i>	<i>3.40</i>
<b>Other</b>								
601	New	Demand Respose - Residential and Commercial	0.00	1.00	1.00	1.00	1.00	0.80
602	Current	Green Building Team	0.00	0.00	0.00	0.00	0.00	0.00
603	Current	Lighting Design Lab	6.00	7.00	8.00	8.00	8.00	7.40
604	Current	Northwest Energy Efficiency Alliance	0.00	0.00	0.00	0.00	0.00	0.00
605	Current	Seattle Energy Code	0.00	0.00	0.00	0.00	0.00	0.00
606	Current	SCL Infrastructure Improvements	0.00	0.00	0.00	0.00	0.00	0.00
<i>Other Program Subtotal</i>			<i>6.00</i>	<i>8.00</i>	<i>9.00</i>	<i>9.00</i>	<i>9.00</i>	<i>8.20</i>
<b>All Programs Subtotal</b>			<b>40.00</b>	<b>52.00</b>	<b>54.00</b>	<b>54.00</b>	<b>54.00</b>	<b>50.80</b>
<b>Infrastructure</b>								
701		Management	8.00	9.00	9.00	9.00	9.00	8.80
702		Support - Labor	10.00	10.00	10.00	10.00	10.00	10.00
703		Planning & Evaluation	3.00	10.00	13.00	13.00	13.00	10.40
704		Information Management	0.00	0.00	0.00	0.00	0.00	0.00
705		Intern Program	0.00	0.00	0.00	0.00	0.00	0.00
706		Marketing	2.00	4.00	4.00	4.00	4.00	3.60
707		Miscellaneous	0.00	0.00	0.00	0.00	0.00	0.00
708		M&V	0.00	1.00	1.00	1.00	1.00	0.80
<i>Infrastructure Subtotal</i>			<i>23.00</i>	<i>34.00</i>	<i>37.00</i>	<i>37.00</i>	<i>37.00</i>	<i>33.60</i>
<b>Total</b>			<b>63.00</b>	<b>86.00</b>	<b>91.00</b>	<b>91.00</b>	<b>91.00</b>	<b>84.40</b>