

CIP White Paper

Seattle City Light
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Section 1 - Overview

Seattle City Light (City Light) is a municipal electric utility, owned by the residents of Seattle and run by the City's elected officials. The Utility serves a population of almost 700,000 people living in a 130 square-mile area, which includes the City of Seattle and several adjoining jurisdictions. To serve these customers, City Light owns, maintains, and operates a multi-billion-dollar physical plant. The physical plant includes:

- ◆ A power supply generation system consisting of seven hydroelectric plants on the Pend Oreille (Boundary Dam), Skagit, Cedar, and Tolt Rivers with a combined capacity of almost 2,000 megawatts;
- ◆ 650 miles of high-voltage transmission lines linking these plants to Seattle;
- ◆ A distribution system with 14 major substations and more than 2,500 miles of overhead and underground cable;
- ◆ A state-of-the-art System Control Center coordinating these activities; and
- ◆ Billing and metering equipment tracking approximately 395,000 accounts.

City Light's Capital Improvement Program (CIP) is the vehicle for repairing, upgrading, and expanding this infrastructure. The CIP also funds a variety of safety improvements, mitigation activities, and licensing requirements. The CIP's overriding goal is to ensure that the facilities required to serve City Light customers with low-cost, reliable power, are in place when and where the power is requested. Funding for the CIP comes primarily from retail electricity sales, sales of surplus power on the wholesale market, and the sale of revenue bonds.

The City Council adopted a new Strategic Plan for City Light in July 2012, which established spending priorities and a six-year rate path for the Utility. The Strategic Plan guided development of the 2013 City Light budget and CIP.

Section 2 - Summary of Upcoming Budget Issues and Challenges

In developing the Strategic Plan, the Utility identified baseline capital expenditures and developed strategic initiatives for replacing aging infrastructure, automating electrical system control, and leveraging new technology to meet the expectations of City Light customers. Additional issues include regional transmission congestion and regulatory requirements to improve the security and reliability of the transmission grid. A list of Strategic Plan initiatives with capital components is provided in Section 6.

Recent investments in Utility systems will help identify and evaluate future capital proposals. WAMS provides the platform for tracking City Light's estimated 900,000 assets, as well as generating the associated work orders and maintenance records of the Utility. The initial

phase of Work and Asset Management System (WAMS) went live for distribution operations and engineering groups in 2011. Work is currently underway to extend WAMS to cover substation operations and power supply assets. This final phase of WAMS is scheduled to go live in the spring of 2013.

Tracking this asset information will allow the Utility to achieve operational efficiencies, improve maintenance practices on assets, and identify equipment where there is a high risk of failure. Data in WAMS will be used to develop strategic asset management plans for each asset type (generation equipment, large power transformers, substation circuit breakers, poles, underground distribution systems, etc.) and will inform operational and maintenance practices and capital replacement decisions.

Through the asset management program, the Utility has already conducted condition assessments on 115,000 poles and 28 power transformers, has surveyed 527 miles of overhead transmission lines, and has adjusted the CIP based on the results. The Utility has prepared a Distribution Outlook report that contains more detail on the ‘distribution wires’ assets. The outlook is being expanded in 2012 to include transmission and substation assets and will be available to guide future investment decisions.

Customers will benefit from a strong asset management program and SCL will make more efficient use of resources both physically and financially. We will improve prediction of when equipment will need maintaining or replacing, which will translate into improved outage and emergency management. Reductions in outage time and costs associated with emergency repairs will provide customers with better service.

Section 3 - Thematic Priorities

Projects included in the CIP meet a variety of thematic needs:

- ◆ **Maintain existing infrastructure and support basic operations** – The majority of City Light’s CIP projects provide for the maintenance and upkeep of existing systems and equipment, and support the on-going daily operations of the Utility. These projects include major maintenance work to extend the life and function of facilities and equipment, scheduled replacement of old and failing equipment, and capital programs to support customer connections and repair unexpected system outages. Projects are also included in the CIP to respond to external conditions, such as relocations due to major transportation projects. The CIP includes projects to implement Strategic Plan initiatives to renovate streetlights and underground cables.
- ◆ **Upgrade capacity and services to provide new functionality** – Projects proposed in the CIP may also seek to increase the Utility’s generation or distribution capacity, or provide new functionality for the management and customer service systems of the Utility. These projects strive to change the way the Utility operates and delivers service. The 2013-2018 CIP included continuing funding for projects such as the Work and Asset Management System, the Customer Information System, and the

Energy Management System. In addition, new projects such as the Denny Substation and Automated Metering Infrastructure are proposed to implement the approved Strategic Plan.

- ◆ **Address licensing, regulatory and safety requirements** – Federal licenses governing the operation of the Utility’s dams require a number of environmental, historic preservation, and recreation mitigation measures. In addition, federal requirements regulating the transmission grid and energy market transactions require system upgrades and improvements. The CIP also includes projects to improve safety and proactively reduce risk to the Utility’s infrastructure. The CIP implements Strategic Plan initiatives addressing transmission grid improvements and regulatory compliance.
- ◆ **Maintain the Utility’s information technology systems** – Over the last several decades, the electric utility industry increasingly relied on information technology systems to provide real time management and automation of operations, design and digitally record utility systems and assets, regulate power across the regional transmission grid, manage financial transactions on the energy market, and increase business efficiencies throughout the organization. The CIP includes projects to maintain the hardware and software necessary to provide these functions. The CIP implements Strategic Plan initiatives to improve cyber security and disaster recovery.

Section 4 - Project Selection Criteria

Project ideas, generated from staff throughout the organization, are developed into proposals by the operational divisions of the Utility. Each of the Utility’s organizational lines of business (power supply, transmission and distribution, customer service) prioritizes proposed capital spending within their divisions and submits recommended projects to a centralized capital budgeting system.

City Light management compares proposals against criteria that evaluate the projects’ costs, benefits, and risks. The Utility gives priority to mandatory requirements and projects currently underway, before considering scheduled future projects and new initiatives. Business cases are developed and revised to document the projects’ expectations and rationale, and include a cost benefit analysis of alternatives, including the do nothing scenario.

The Utility’s CIP is constrained by the availability of funding and labor resources to devote to capital projects. City Light management seeks to balance the overall needs of the Utility within these constraints and may rescope, reschedule, or defer projects to prepare a comprehensive six-year CIP. The Strategic Planning process provides a venue for vetting major capital spending decisions with elected officials and the public. City Light intends to revisit the recently adopted Strategic Plan every two years to maintain transparency and set direction for future CIP development.

Section 5 - Aligning Infrastructure with Planned Growth

City Light carefully monitors load and reliability and recommends capital investments to assure that customers have access to reliable electrical power when they need it.

City Light uses its participation in the IDT Permit Review Team and in planning for large public projects such as a new sports arena and expansions of light rail and streetcars to identify CIP project work that will be required. Some CIP projects are ongoing, such as pole replacement or substation equipment replacement, and are not tied to specific development projects. Unless significant area redevelopment (such as Light rail expansion and the expected growth around transit stations, or a major up-zone in areas of downtown) occurs, the existing electrical system is adequate to serve new customers' load. In the majority of cases, work proposed in the budget is based upon a history of customer requests or to address reliability issues in an area.

Enhancements to geographic reporting are planned in concert with the development of an integrated GIS System (a Strategic Plan Initiative). The full implementation of the Work and Asset Management system will allow employees to search by an address for a specific location or by 'area' -- this grid overlay will assist in the identification of work.

City Light has been involved in the overall City effort to support the development in Urban Centers and Villages, including the current Comprehensive Plan update and the Neighborhood Planning process. Area load forecasts done as part of the Denny Substation Project Ordinance identified the expected system impacts of load growth at the substation level. CIP projects being proposed in the Strategic Plan to support expected load growth include the construction of the Denny Substation and building the duct and vault system to support network distribution feeders in the surrounding area.

Section 6 - Future Projects/What is on the Horizon

A new City Light Strategic Plan has been adopted. CIP projects are proposed that implement the capital portion of the Strategic Plan initiatives:

- Denny Substation Program
- Transmission System Improvements in Puget Sound Area
- Cable Rehabilitation and Replacement
- Streetlight Infrastructure Replacement
- Customer Focused Web Redevelopment
- Compliance Tracking System and Compliance Program Standardization
- Technical Training Center
- Integrated Geospatial Information System
- IT Disaster Recovery Program
- Replace/Upgrade PeopleSoft Financial System
- Enterprise Document Management System

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- Implement IT Security Upgrades
- Reduce Environmental Liability
- Performance Based Reporting
- Advanced Metering Infrastructure
- Mobile Workforce Implementation

In addition to these specific initiatives, the Strategic Plan includes a general efficiency initiative that reduced overall funding for the CIP in the 2013-2014 Proposed Budget. An additional initiative on Project Management Quality Improvements is also expected to improve efficiencies in CIP project delivery.

Section 7 - CIP Revenue Sources

Funding for City Light's CIP comes from cash from operations and debt. Cash from operations comes primarily from retail electricity sales and surplus energy sales on the wholesale market. A minor amount of additional revenue comes from direct customer billing (including service connections and other customer requested work) and assorted fees, grants, and transactions. City Light's policy is to limit debt financing to no more than 60% of the CIP (Resolution 31187).

Section 8 - CIP Spending by Major Category

Beginning in 2011, the Utility has provided additional summary information to break down the CIP by category in response to Council's desire to provide more documentation and transparency of capital expenditure decisions. The 2013-2018 Proposed CIP summarizes spending in the following categories:

Power Supply: Projects in this category include improvements to City Light's dams, generators, powerhouses, and other related projects. Projects to comply with federal licensing and environmental mitigation requirements at City Light's dams are also included in this category. City Light sequences work on major power production equipment (i.e., generator rebuilds and runner replacements) to reduce the impact to power generation and level capital spending.

Transmission: Projects in this category include transmission capacity and reliability projects to deliver power from City Light's dams to City Light's distribution system and connections to the regional power grid. City Light owns and maintains 650 miles of transmission capacity that connect the Skagit Facilities to Seattle. City Light leases additional transmission capacity to connect to the Boundary, Cedar Falls, and Tolt Facilities.

Distribution: Projects in this category include improvements to City Light's distribution substations, relays, feeders, network distribution systems, overhead and underground radial distribution systems, service connections, customer meters, and other projects related to the distribution system.

External Projects: Projects in this category respond to requests from local jurisdictions to relocate distribution services from overhead to underground systems per the terms of franchise agreements, maintain and upgrade the streetlight system, relocate utility infrastructure in response to major transportation projects, and provide capital improvements in response to other customer-requested service needs.

Central Utility Projects: Projects in this category provide for centralized billing and customer service systems, financial and information technology systems that are critical to the Utility’s operation, and vehicle fleets and facilities that are not part of the power generating plant (e.g., equipment shops, service centers, and maintenance yards).

Summary of CIP Project Allocations (in \$1,000s)

	2013	2014	2015	2016	2017	2018	Total
Power Supply	62,455	56,089	88,360	88,030	67,109	79,473	441,516
<i>Boundary</i>	37,223	25,577	57,202	65,464	47,841	65,078	298,385
<i>Skagit</i>	17,562	22,205	21,184	15,976	11,321	9,269	97,517
<i>Cedar Falls - Tolt</i>	1,710	1,786	3,678	1,644	4,535	1,751	15,104
<i>Power Supply</i>	5,960	6,521	6,296	4,946	3,412	3,375	30,510
Transmission	4,724	4,066	12,271	22,793	16,358	16,210	76,422
Distribution	132,211	150,128	205,913	195,351	167,892	136,831	988,326
<i>Substations</i>	19,622	35,026	51,225	29,132	24,020	20,655	179,680
<i>Network</i>	18,020	21,479	32,232	43,733	23,919	18,877	158,260
<i>Radial</i>	46,243	49,213	51,716	53,847	51,797	52,967	305,783
<i>Service</i>	32,987	33,956	62,735	61,359	61,929	37,731	290,697
<i>Distribution Other</i>	15,339	10,454	8,005	7,280	6,227	6,601	53,906
External Projects	31,211	45,149	47,373	26,289	24,672	25,247	199,941
<i>Local Jurisdictions</i>	16,865	14,496	12,950	13,346	13,680	14,022	85,359
<i>Transportation</i>	14,299	30,615	34,384	12,903	10,923	11,154	114,278
<i>Customer Other</i>	47	38	39	40	69	71	304
Central Utility Projects	52,133	43,789	27,405	23,890	16,256	15,729	179,202
<i>Customer and Finance and IT</i>	16,362	4,004	956	0	0	0	21,322
<i>Fleets and</i>	9,779	17,500	13,884	11,517	5,317	4,509	62,506
	25,992	22,285	12,565	12,373	10,939	11,220	95,374
Totals:	282,734	299,221	381,322	356,353	292,287	273,490	1,885,407