



Seattle City Light



PREPARING SEATTLE CITY LIGHT FOR CLIMATE CHANGE

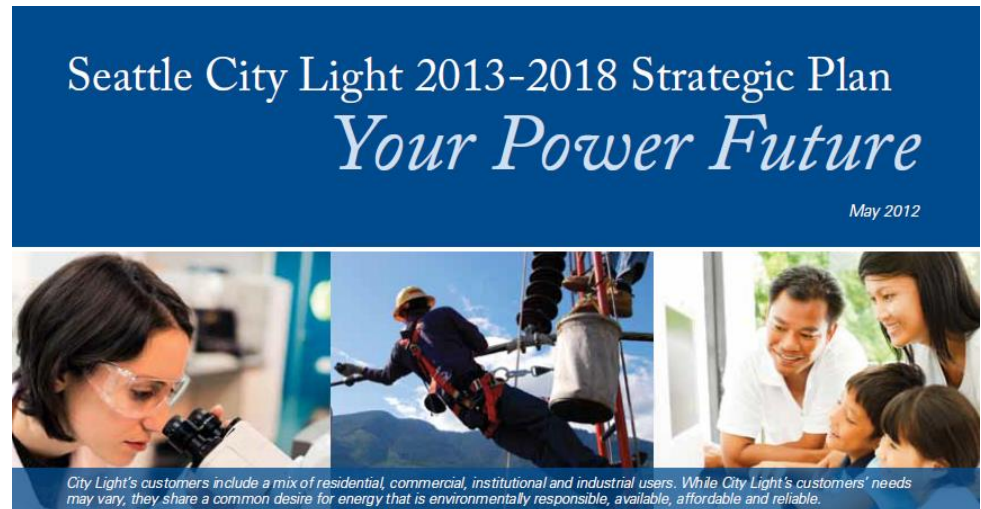
Ronda Strauch, Ph.D.

Climate Adaptation Strategic Advisor
Environment, Land and Licensing

T & U Committee | February 5, 2020

Strategic Plan: Climate Initiative (2013-2018)

1. Create a climate change adaptation strategic advisor position
2. Research climate change impacts on the utility
3. Develop a utility-wide adaptation plan



CITY LIGHT CLIMATE ADAPTATION PLAN

- Identified observed and potential changes in climate
- Evaluated impacts and assessed vulnerability
- Developed adaptation strategies

Seattle City Light Climate Change Vulnerability Assessment and Adaptation Plan

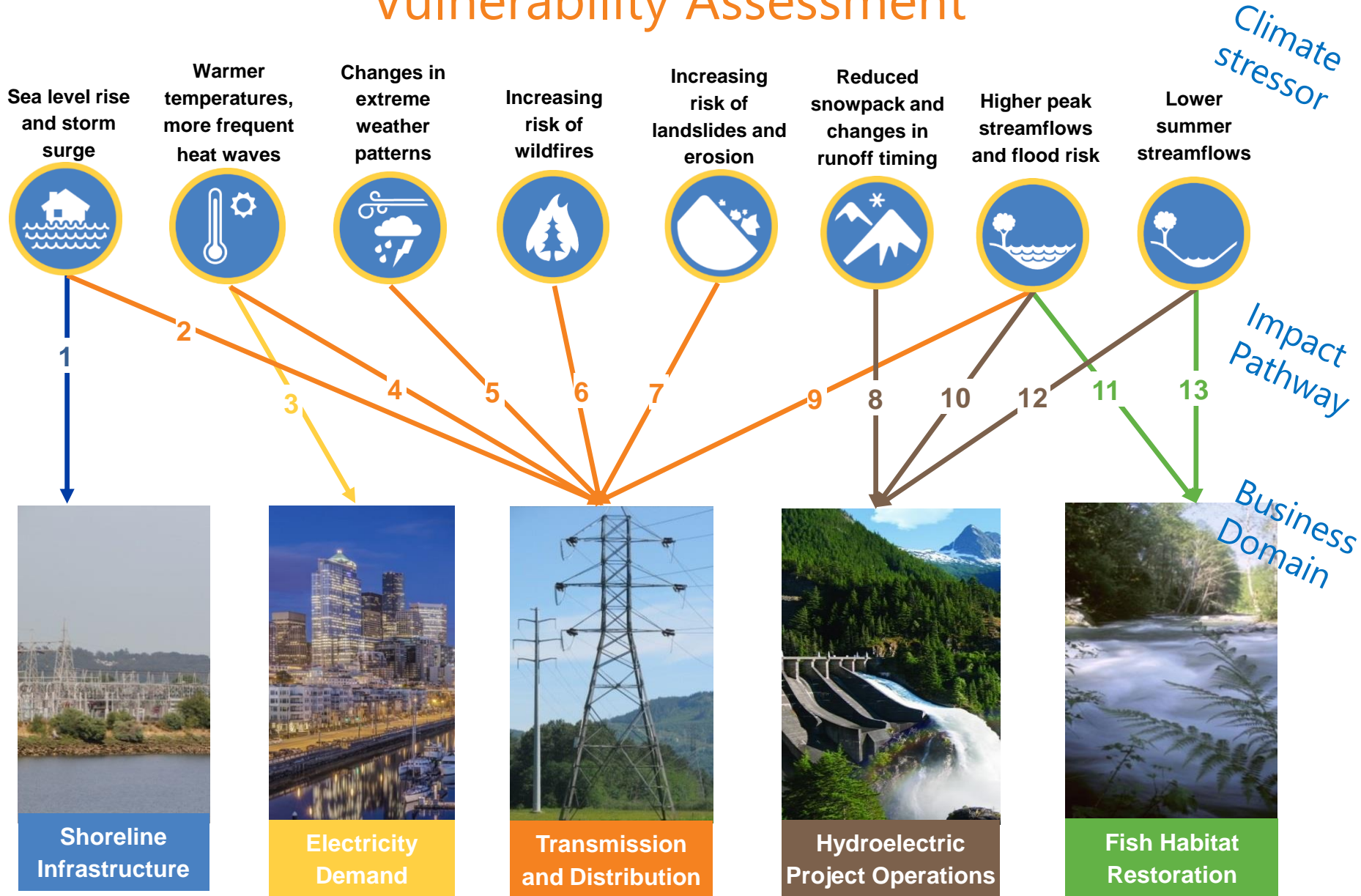


Prepared by Crystal Raymond
Climate Adaptation Strategic Advisor
Environmental Affairs and Real Estate Division
For more information contact: Crystal.Raymond@Seattle.gov | (206)-386-1620

 Seattle City Light

2015

Vulnerability Assessment

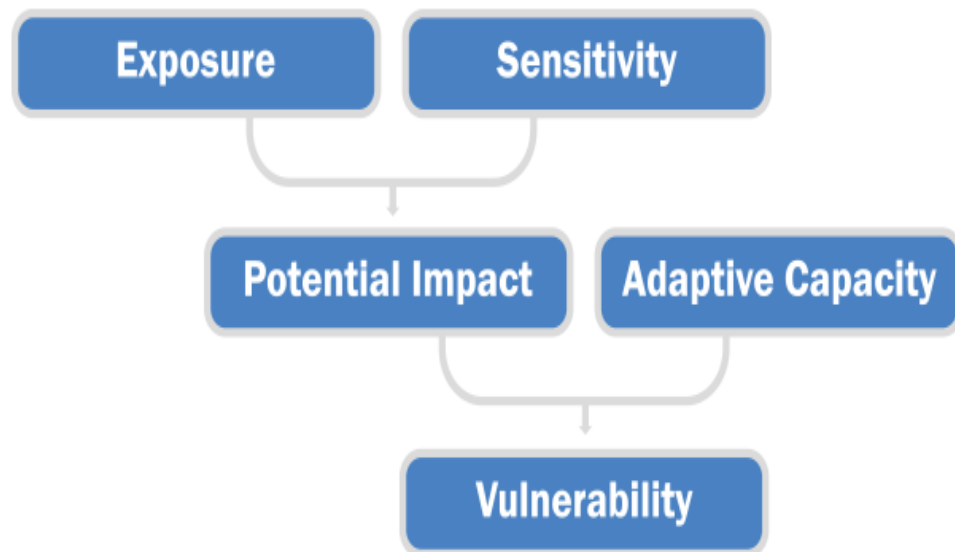


Vulnerability Assessment: How is the Utility at Risk?

Mission

Seattle City Light is dedicated to delivering customers affordable, reliable, and environmentally responsible electricity services.

Our Approach



Excerpt of Vulnerability Assessment

Table 1. Summary of vulnerability and potential magnitude of climate change impacts to Seattle City Light

Utility Function	Impacts Caused by Climate Change*	Time	Vulnerability			Potential Magnitude** of Impact to				Ref. Pages
			Exposure	Sensitivity	Capacity to Adapt	Financial Cost	Safety	Reliability	Environmental Responsibility	
Coastal properties	Tidal flooding due to higher storm surge and sea level rise	2030	○	●	●	Low	–	–	Low	18-24
		2050	●	●	●	Mod	–	–	Low	
Transmission and distribution	Tidal flooding and salt water corrosion due to higher storm surge and sea level rise	2030	○	○	●	Low	–	Low	–	18-24
		2050	●	○	●	Low	–	Low	–	
	Reduced transmission capacity due to warmer temperatures	2030	●	○	○	Low	–	Low	–	34-39
		2050	●	○	○	Low	–	Low	–	
	More frequent outages and damage to transmission and distribution equipment due to changes in extreme weather	2030	○	●	●	Low	Low	Low	–	40-46
		2050	○	●	●	Low	Low	Low	–	
	More damage and interruptions of transmission and generation due to wildfire risk	2030	●	●	●	High	High	Med	–	47-53
		2050	●	●	●	High	High	Med	–	
More damage to transmission lines and access roads due to landslide risk	2030	●	●	●	Med	Low	Med	–	54-58	
	2050	●	●	●	Med	Low	Med	–		
More damage and reduced access to transmission lines due to more frequent river flooding and erosion	2030	●	●	●	Med	–	Low	–	71-74	
	2050	●	●	●	High	–	Low	–		
Energy Demand	Reduced electricity demand for heating in winter due to warmer temperatures	2030	●	●	●	Med	–	Low	–	25-33
		2050	●	●	●	High	–	Low	–	
	Increased electricity demand for cooling in summer due to warmer temperatures	2030	○	○	●	Low	–	Low	–	25-33
		2050	●	○	●	Med	–	Med	–	

*The impacts are those caused by climate change in addition to historical conditions; most existing hazards (such as windstorms) will continue.

**Magnitude refers to the average event or normal condition for the timeframe, not the worst possible year or event that could occur.

Hydroelectric Project Operations: Key Impacts



Less snowpack and earlier snowmelt will affect seasonal operations



Higher peak streamflow may increase spilling at hydroelectric projects – lost generation and impacts on fish



Lower streamflow in summer may make it more difficult to meet instream flows for fish and reservoir elevations for recreation



Hydroelectric Project Operations

Electricity Demand: Key Impacts



Higher electricity demand for cooling could cause summer peaks to approach winter peaks in areas with high commercial loads



Lower electricity demand for heating in winter will reduce retail revenue and have financial impacts on the utility



**Electricity
Demand**

Transmission and Distribution: Key Impacts



Slower outage restoration times due to heavy precipitation and urban flooding



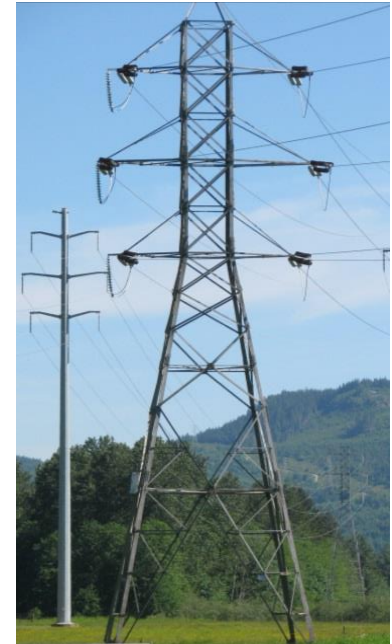
Increased risk of wildfires causing damage to and interruptions of transmission lines and generation facilities



Increased risk of landslides damaging transmission towers and access roads



Increased risk of river flood damage to transmission towers and access roads located in floodplains



Transmission and Distribution



CLIMATE ADAPTATION LEADERSHIP AWARD

"outstanding leadership to advance the resilience of the nation's living natural resources in a changing climate"

~U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration
(+ 12 other federal agencies)





Seattle City Light

IMPLEMENTATION PLAN

- Collaboration
- Research
- Projects
- Education



Collaborations

- Dept. of Energy – Partnership for Energy Sector Climate Resilience
 - Attributes of a resilient utility
 - Resilience self-assessment
- CEATI – Hydropower Operations & Planning Interest Group
 - CCORA Working Group
- Partners – Swinomish Indian Tribal Community, Sauk-Suiattle Indian Tribe, National Park Service, USGS, Forest Service, Universities, Mountains to Sound Greenway Trust



Research

- Streamflow modeling to help with:
 - Skagit Hydroelectric Project FERC Relicensing
 - Integrated Resource Plan (IRP)
- Water temperature modeling
- Landslide modeling
- Glacier monitoring and modeling
- Smoke and energy use
- Changes in weather extremes



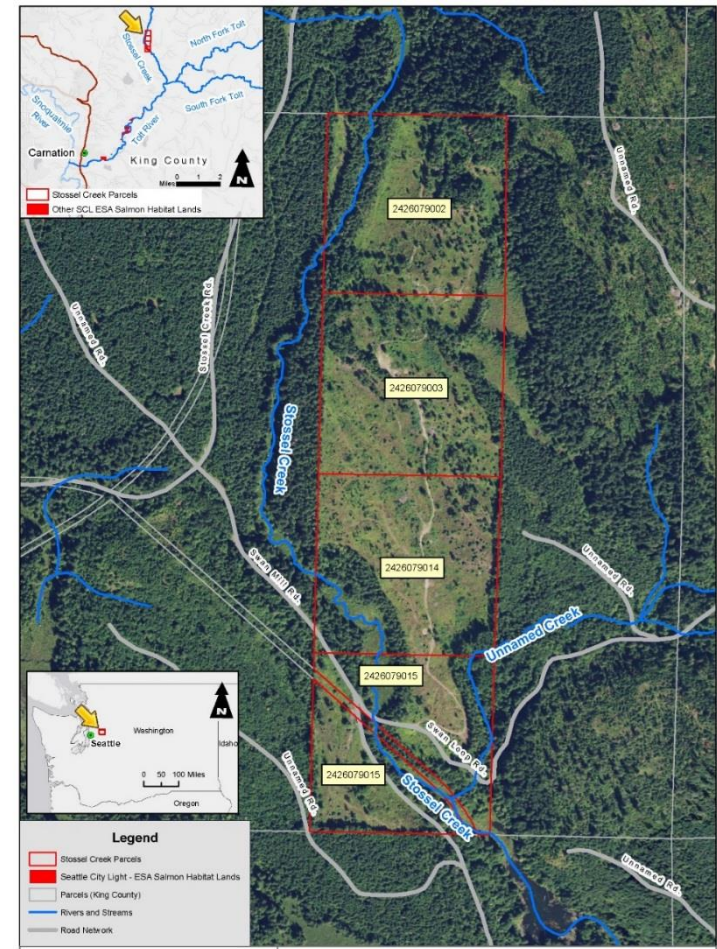
Projects - Increase Wildfire Resilience

- Upgrade infrastructure for wildfire resilience
- Collaborate with landowners to reduce vegetation and wildfire risk near hydroelectric projects
- Increase wildfire response and preparedness capability: mutual aid agreements, staff training, evacuation plans, and “defensible space” programs



Projects - Habitat Restoration

- Stossel Creek adaptive reforestation project
- Reforest with species adapted to warmer, drier climates
- Planting 51 acres along critical salmon and steelhead habitat in the Tolt Watershed



Now
Online!

[http://www.skagitclimatescience.org/
projected-changes-in-streamflow/](http://www.skagitclimatescience.org/projected-changes-in-streamflow/)

Projects - Streamflow Visualization Tool

Mid-Century

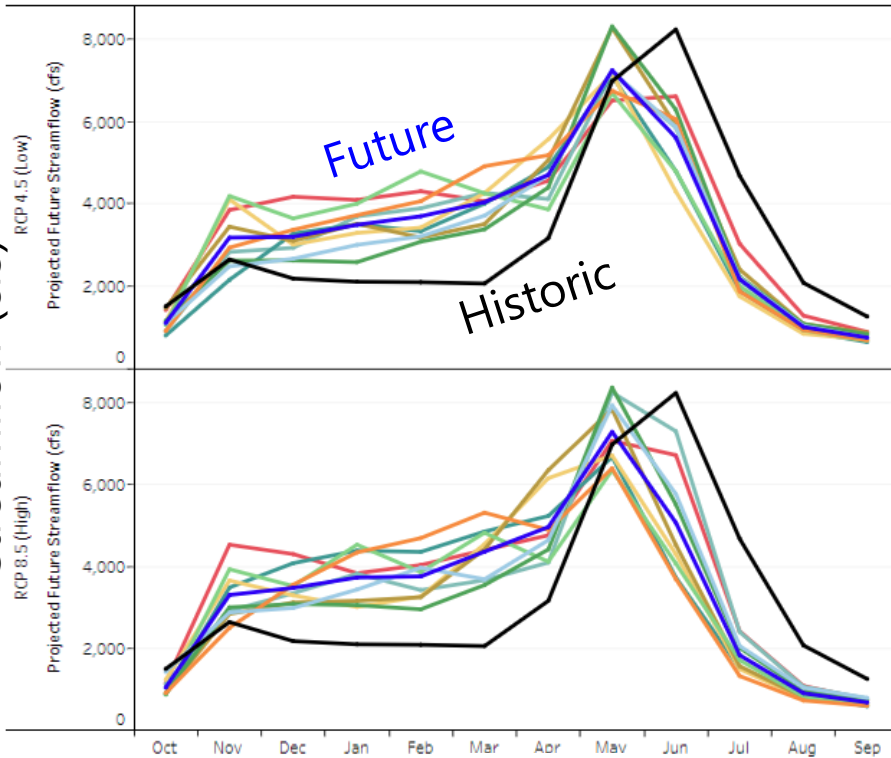
Location: Ross Bias Corrected: Yes

Unregulated Streamflow: Mean Scenario: RCP 4.5 (Low) & RCP 8.5 (High)

Select Model Output

(bias-corrected data only available for bias-corrected locations, see map)

Monthly Streamflow (Bias Correction)



Oct Water Years: 2030-2059 Sept

Location: Ross Bias Corrected: Yes

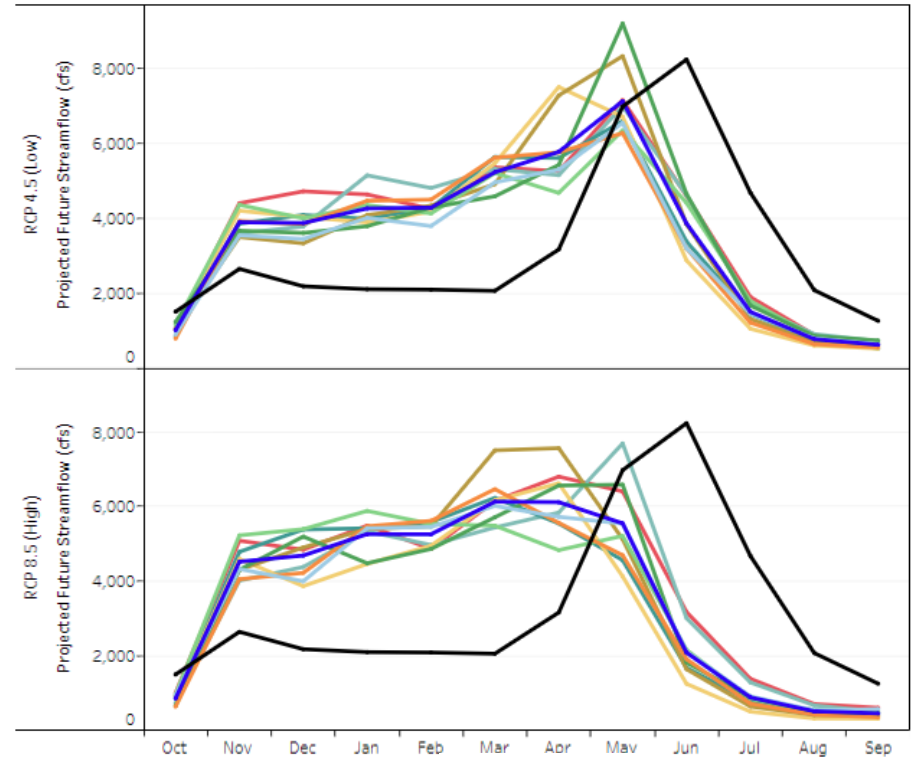
Late-Century

Unregulated Streamflow: Mean Scenario: RCP 4.5 (Low) & RCP 8.5 (High)

Select Model Output

(bias-corrected data only available for bias-corrected locations, see map)

Monthly Streamflow (Bias Correction)



Oct Water Years: 2070-2099 Sept



UPDATE ASSESSMENT AND IMPLEMENTATION PLAN DURING 2020

- Advancements in climate data and impacts
- New adaptation strategies and priorities
- Implementation plan
- Metrics baseline and reporting



CITY LIGHT

OUR MISSION

Seattle City Light is dedicated to delivering customers affordable, reliable and environmentally responsible electricity services.

OUR VISION

We resolve to provide a positive, fulfilling and engaging experience for our employees. We will expect and reinforce leadership behaviors that contribute to that culture. Our workforce is the foundation upon which we achieve our public service goals and will reflect the diversity of the community we serve.

We strive to improve quality of life by understanding and answering the needs of our customers. We aim to provide more opportunities to those with fewer resources and will protect the well-being and safety of the public.

We aspire to be the nation's greenest utility by fulfilling our mission in an environmentally and socially responsible manner.

OUR VALUES

Safety, Environmental Stewardship, Innovation, Excellence, Customer Care



Seattle City Light